IMAGING SYSTEM
TECHNICAL MANUAL

Version 2.0

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Department of Veterans Affairs
V*IST***A** Software Development
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Preface

The purpose of this manual is to provide information about the structure and function of the logical components of the Veterans Health Information Systems and Technology Architecture (**V***IST***A)** Imaging V. 2.0 package (i.e., files, routines, and configuration that comprise Imaging V. 2.0). Although this document describes some security functions, sensitive information regarding Imaging V. 2.0 can only be found in the Security Guide.

This document describes:

- How to implement and maintain Imaging V. 2.0, its routines and files, options, and cross-references among files.
- How files are archived and purged.
- The established relations among Imaging V. 2.0 components and other components inside and outside of the Imaging software.
- How to find online documentation for Imaging V. 2.0.

The **V***IST***A** Imaging System V. 2.0 Technical Manual is part of a suite of manuals that includes a release notes document, security guide, user manual, installation guide, and a planning document (Note: The Planning document is provided to supplement **V***IST***A -**required documentation).

The Planning document contains information about sources of hardware necessary for creating a **V***IST***A** imaging workstation. Information about various components (i.e., servers, workstations, and background processors) can be found in the Installation Guide.

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Chapter 1 Introduction

The **V***IST***A** Imaging System is an extension to the Veterans Health Information System Technology Architecture (**V***IST***A**) hospital information system that captures clinical images, scanned documents, electrocardiogram (EKG) waveforms, and other non-textual data files and makes them part of the patient's electronic medical record. Image and text data are provided in an integrated manner that facilitates the clinician's task of correlating the data and making patient care decisions in a timely, accurate way.

The system is designed to provide the treating physician with a complete view of patient data and, at the same time, allow consulting physicians to have access to the image and text data. It serves as a tool to aid communication and consultation among physicians -- whether in the same department, in different medical services, or at different sites.

The **V***IST***A** Imaging System is unique in that management of the medical images is an integral part of a hospital information system.

Imaging workstations located throughout the hospital capture and display a wide variety of medical images including:

- Cardiology
- Bronchoscopy
- GI endoscopy
- Hematology
- Surgical pathology
- Surgery
- Dermatology
- Radiology images

Chapter 2 Orientation

2.1 Documentation Conventions

The following conventions are used in this manual.

Convention	Description
Bold type	User Keyboard Entry
<**RET**>	Return key or Enter key
<**SHIFT**>	Shift key
<**ESC**>	Escape key
<**Num Lock**>	Top left key on the numeric keypad (above the 7), may also be labeled Numeric Lock; this makes any keypad key activate the number shown on its surface; it is the equivalent of a SHIFT LOCK for alphabetic keys

2.2 Special Workstation Procedures

Command	Action
Reboot	1. Push the RESET button on the front of the workstation. 2. If there is no RESET button, power the workstation off and then on; the computer will reboot. 3. It will perform a virus check and load all required software; this takes about 30-60 seconds. 4. When the reboot process is complete, you should be able to sign back into the workstation.

2.3 Mouse/Windows Controls

Control	Description
Mouse button click	• The mouse is a device used to point at positions on the screen. • The mouse may have one, two, or three buttons. • The mouse should be held at the end opposite the cord so the fingers can press the buttons. • The buttons are referred to as the "**Right Mouse Button**", the "**Left Mouse Button**", and the "**Center Mouse Button**". When the mouse is rolled around on a flat surface, the arrow cursor on the screen will move correspondingly. • Pressing and releasing a button is called "**clicking**". You may position the arrow over a portion of the window, such as a button or scroll bar, and then click. This will cause the computer to do something such as display an image, depending on the window. • When the instructions tell you to "press the mouse button," you can assume that you are to press the **left** mouse button.
Select	You may also **select** a rectangular area on the window, by following these steps: 1. Position the arrow cursor so it is over the left upper corner of the area to be selected. 2. Press the left mouse button down and hold it down while you move the mouse to the right lower corner of the rectangle to be selected. 3. Release the mouse button. You will see a dotted rectangle on the window around the area selected.

Control	Description
Drag	If you want to move a window to another area of the window (e.g., to see something on a window that is underneath), follow these steps: 1. Position the cursor over the top colored title area of the window to be moved. 2. Press the left mouse button down and move the mouse until the window is where you want it. 3. Release the mouse button. This is called "**dragging**" a window.
<=>	You may adjust the size of the window by following these steps: 1. Place your mouse at the edge of the window that you would like to move. 2. When you see the cursor turn into a double ended arrow <=>, hold the left mouse button down, and move the mouse until the image is the width and/or height that you would like. 3. Let go of the left mouse button.

Chapter 3 Implementation and Maintenance

3.1 V*IST*A Package Requirements

The **V***IST***A** Imaging System is designed to be used in conjunction with the following **V***IST***A** packages:

- Kernel V. 8.0
- FileMan V. 21
- Medicine V. 2.3
- Laboratory V. 5.2
- Radiology V. 4.5
- Surgery V. 3.0
- PIMS V 5.3
- Health Summary 2.7

The software developers for the following patches have developed callable routines to support GUI applications such as VISTA Imaging. Please ensure that the following patches are installed.

Patch Name	Special Instructions
DG*5.3*124	
SR*3*66	
LR*5.2*121	If patch is not available, contact Imaging development staff.
MC*2.3*6	
MC*2.3*7	
MC*2.3*9	
RA*4.5*11	If patch is not available, contact Imaging development staff.

3.2 Imaging Site Parameters

The Imaging Site Parameters file, the User Preferences file, and the MAG.INI workstation file allow each site to customize its Imaging System (refer to the File List and INI file sections of this manual for a complete description of the fields in these files).

3.3 Maintenance of Software on Imaging Workstations

The translation table on the Background Processor will need to be updated each time the ^MAG global is moved into another volume set on the VISTA servers (refer to the MSM documentation). Any changes to the IP addresses for the VISTA servers or changes to the Kernel Broker Listening port(s) will require updating on the Imaging workstations (refer to the Broker Technical and User manuals).

3.4 Security Keys

The following keys are used in the **V*IST*A** Imaging System V. 2.0 package:

Security Key	Description
MAG CAPTURE	Allows Image Capture of images not related to any Specialty (i.e., "NONE") on the Imaging Capture configuration window. Other keys are needed by the user for the ability to capture images to the Image File when they relate to a specialty.
MAG DELETE	This key allows the holder to delete images from File 2005; pointers in parent packages such as Medicine, Surgery, Lab, and Radiology will also be deleted.
MAG SYSTEM	Given to person(s) managing Imaging/Pacs Systems. Required to modify site parameters entries via the Windows MAGSYS.EXE file.
MAGCAP LAB	User can capture Laboratory images from the Imaging Capture workstation.
MAGCAP MED C	User can capture Cardiology images from the Imaging Capture workstation.
MAGCAP MED G	User can capture GI images from the Imaging Capture workstation.
MAGCAP MED GEN	User can capture Generic Med images from the Imaging Capture workstation.
MAGCAP MED H	User can capture Hematology images from the Imaging Capture workstation.
MAGCAP MED HI	User can capture Internal Hematology images from the Imaging Capture workstation.

Security Key	Description
MAGCAP MED I	User can capture Internal Med images from the Imaging Capture workstation.
MAGCAP MED N	User can capture Neurology images from the Imaging Capture workstation.
MAGCAP MED P	User can capture Pulmonary Endoscopy images from the Imaging Capture workstation.
MAGCAP MED PF	User can capture Pulmonary Function Test images from the Imaging Capture workstation.
MAGCAP MED R	User can capture Rheumatology images from the Imaging Capture workstation.
MAGCAP MED Z	User can capture Consult images from the Imaging Capture workstation.
MAGCAP RAD	User can capture Radiology images from the Imaging Capture workstation.
MAGCAP SUR	User can capture Surgery images from the Imaging Capture workstation.

3.5 Workstation Hardware Maintenance

Workstations tend to collect dust inside of the chassis. They should be periodically opened and cleaned. The accumulation of dust can lead to heat damage of workstation components. Further hardware maintenance should only be done by a qualified individual.

3.6 What to do when a server or disk drive fails

3.6.1 Step 1

Use Enter/Edit Network Location menu option, from the Imaging System Manager Menu, to place the server(s) "OFFLINE". If these are magnetic drives, their images will be automatically pulled from your jukebox.

3.6.2 Step 2

If the Image Network Write Location or PACS Image Write Location field in the Imaging Site Parameters File (2006.1) points to a device that is down, edit it to point to a location that is operational. Use the Edit Image Write Location from the Imaging System Manager menu.

3.6.3 Step 3

If you have a PACS interface that normally writes to the device that has failed, notify the vendor to change the device they are using.

3.6.4 Step 4

When your server or disk drive has been repaired, edit the operational status field of the Network Location File to "ONLINE". You may want to edit the Write Location so they use their original location.

Chapter 4 Security Software Maintenance

4.1 Anti-virus Considerations

Anti-virus products claim to stop all viruses known and unknown. Often, they do not give details about the features implemented, how they function, or how to test for a correct configuration. A spelling checker or backup utility can be tested, but a virus checker demands either blind faith by the purchaser, or a library of viruses (that must be "found" by the client and used to infect the hard disk).

Anti-virus programs have numerous configuration schemes. Their setup requires the user to choose an appropriate action when a virus is found. If the action chosen is "destruction" of the virus and an extensive report is not logged to disk, the result could easily be as disastrous as the virus itself. The automatic anti-virus functions of eradication do not always include a list of files that were deleted.

The various products use techniques that are slightly different from each other and occasionally will warn of virus contamination when no virus is present —giving a *false positive*. This notification can occur when some other anti-virus product is on the hard drive being scanned or if one virus scanner is activated followed by a second scanner—the first product not having "cleaned up" memory after it completed its scan.

Most anti-virus products require frequent updating. The up-to-date determination of whether a live virus has been identified correctly, and how to clean the infected system, is only known by the anti-virus support staff. This service can range from immediate phone service with 24-hour coverage, to "mail in a disk" for analysis. Bulletin Boards are provided by some manufacturers, but do not always contain the information necessary (e.g., a list of commercial software that will cause "false positives").

Scanning should provide identification of the virus encountered. That information may enable the user to determine the extent of the damage and how recovery may be initiated.

We offer the following advice: The best way to deal with viruses is to prevent them from happening. The following guidelines, if maintained, should keep your **V***IST***A** Imaging System virus-free. Contact the VA CIO Security Service for updated information.

4.2 Guidelines

- Provide central reporting of scanning activity for network and workstation administration.

- Provide automatic anti-virus scanning.

4.3 PC Security Control - Points of Vulnerability

This table identifies areas of PC vulnerability and what can be done to prevent violation.

Problem	Prevention
Theft of PC.	Cable lock securing PC box unit and monitor to supporting furniture.
Theft or altering of internal electronic boards.	Cable lock can prevent opening case of PC box unit.
Hardware boot of PC (POST) will check for the proper configuration each time the PC is started.	Double check for presence of installed features and CMOS configuration.
Alteration of CMOS.	Set password control on CMOS. Alteration usually results in an error message and inability of PC to function.
If a diskette is inserted in the floppy drive during PC startup, the program on the diskette can control further operations.	CMOS Boot Sequence Setting or DOS access control software can prevent the user from using the PC floppy drive.
Alteration of Config.Sys and Auto exec.Bat files (Window 95).	DOS access control software can prevent changes or deletions. It will also prevent viewing the contents of the file. It can record attempts to violate security.
Alteration of Registry and files on disk (Windows NT).	Use Poledit to prevent user modification of Registry. Use access privileges to prevent access to a particular directory.
During the running of the Autoexec.Bat file, a PC can be halted and the control rerouted to the user (Windows 95).	DOS access control software can prevent user intervention.

Problem	Prevention
PC viruses (programs designed to corrupt other programs) can infect computer programs.	PC anti-virus programs can scan for virus programs, identify infected areas of the PC, limit further corruption, record alerts for system administrators, and notify users of the problem.
Malfunctions (intentional and unintentional) can corrupt programs stored on the hard disk.	Integrity check all programs on the hard disk regularly.

4.4 Viruses, Trojans, and Worms

Types of Code that Infect Systems:

- Viruses - attach to code, then replicate and/or become destructive.
- Trojans - destructive code that appear to be useful programs.
- Worms - programs that spawn additional copies.

Virus Classifications:

- Macro viruses
- Boot infectors
- File infectors
- Boot and File infectors

Categories:

- Common
- Polymorphic - mutates to avoid detection.
- Stealth - displays false system information to avoid detection.

Reports show that the percentage of sites infected by single or multiple viruses is steadily increasing. It is claimed that anti-virus products protect a very small percentage of computers.

Reports show that contamination is usually from diskettes that employees use at home and in the office. Some anti-virus software manufacturers have been addressing this by offering site licenses covering both the work area, and the home computers of employees and contractors.

Users should be aware that new software, being compressed (ZIPed files) for distribution, may not be checked in the compressed state by some anti-virus products. Anti-virus products, while active, can cause new software to be installed incorrectly.

All staff members should be instructed on the proper configuration of the Antivirus software (which is available through the VA Security personnel) for both office and home computer use. Staff members should attend periodic updates by local virus/security associations. They should join network user groups, security associations, and use the NIST Bulletin Board.

Updated copies of several anti-virus products should be available to support staff, including access to the manufacturer's Bulletin Boards and technical support staff.

Users should be encouraged to report suspected virus activity.

Chapter 5 Routine Descriptions

5.1 VISTA Imaging System Workstation Routines

Name	Description
MAGDELP1	RPC calls for image utilities.
MAGFILEA	Create file reference from ^MAG(2005
MAGGTAU	Imaging auto-update RPC calls
MAGGTCP	Miscellaneous patient lookup utility
MAGGTCPR	RPC Calls for Patient DHCP Reports
MAGGTIA	RPC to update the Image file (2005).
MAGGTIA1	RPC Call to Add Image File entry
MAGGTIG	RPC Callbacks to Get Image lists
MAGGTLB	RPC call for Laboratory/Imaging interface
MAGGTLB1	RPC routine for Imaging Lab Interface
MAGGTMC	Calls for Medicine procedures
MAGGTMC1	MAGG Calls for Imaging/Medicine procedures
MAGGTMC2	UPDATE/CREATE MED PROCEDURE WITH IMAGE POINTER
MAGTMCN	Calls for Imaging/Medicine procedure
MAGGTPT	RPC Calls for Patient utilities
MAGGTPTS	RPC Temporary Patient security check
MAGGTRA	RPC Call to list Patient's Rad/Nuc Exams, Reports
MAGGTRAI	Images for the selected Radiology Exam

Name	Description
MAGGTRP1	Display Associated Report
MAGGTRPT	Display Associated Report
MAGGTSR	IMAGING – SURGERY CASE LIST
MAGGTSR1	IMAGING - ADD IMAGES TO SURGERY FILE
MAGGTU1	RPC Image file utilities; get file path and extension
MAGGTU2	Generated from "magcalls" print template (#3823)
MAGGTU3	Silent calls for Doc Imaging
MAGGTU4	RPC calls for Doc Image Prototype
MAGGTU5	Imaging silent misc. utilities
MAGGTU6	Imaging silent misc. utilities
MAGGTUP	Imaging System User preferences
MAGIPRE	Clean out some dd's and data ;12/28/93 12:33
MAGLOG	Log image access
MAGOSF	Host Operating System Functions
MAGRDEL2	Add data to 2005.15 Teleconsult File
MAGRDEL3	DELPHI API CALLS
MAGRIC	Radiology Image Display Routine ;4/7/95 14:29
MAGUNET	EDIT NETWORK LOCATION COMPANION
MAGUXRF	IMAGING MUMPS CROSS-REFERENCES

5.2 Background Processor Manager UCI Routine Descriptions

Name	Description
ZMAGOSF1	Operating system functions MSM (will install as a % routine)

5.3 Additional Routines Used on the Background Processor

The Background Processor can create the ABSTRACTS (small pictures) for the Imaging Workstations. It also controls the JUKEBOX Server and handles import/export file migration.

The Background Processor hardware and software is identical to the Imaging Workstation, except that it does not need an AT-VISTA board. Software installation for the Background Processor is almost identical to the Imaging Workstation. MUMPS allows the Background Processor to call the DOS Shell to accomplish the image manipulation tasks (MSM-PC/PLUS invokes the DOS shell via the &SHELLDOS external function call).

Routine Name	Description
MAGBAPI	Handles the creation of the background server queues.
MAGBMAIN	Main controlling process for Background Processor. Polls queues for activity and passes control to the appropriate routine to process the queue entry. Updates queue entry upon completion of processing.
MAGBINIT	Initialize MAGBMAIN on a system -- must be run first before MAGBMAIN. MAGBINIT can be tailored to have separate independent MAGBMAIN processes running on different machines handling different queues.
MAGBSTRT	Routine to start a background job. Handles DDP checking and error trap.

Routine Name	Description
MAGBABST	Abstract creation driver program. Checks for the existence of the full size image and then invokes **ABSTRTGA.EXE** to create the actual abstract.
MAGBEXPT	Copies an image from the \image subdirectory to the appropriate h:\export\subdir.
MAGBIMPT	Copies an image from the h:\export\subdir subdirectory to the appropriate \image. An abstract will then be created and the images will be archived to the Jukebox.
MAGBJBX0	Low level jukebox function calls.
MAGBJBX1	Initial setup to copy a full image and abstract to the jukebox.
MAGBJBX2	Copy the full image and abstract to the jukebox.
MAGBJBX9	Mount a jukebox platter and check that the proper platter gets loaded.
MAGBJBXI	Routine to initialize JUKEBOX file (2006.032).
MAGFILE	Creates the image file path by joining the entries in the Image file and the Network Location file. If the file has migrated to the jukebox, MAGFILE invokes JBTOHD^MAGBAPI to copy the file back to the hard disk.
MAGBIDEL	Images that have not been accessed for xxx days are deleted from the hard drive. The images must have previously been written to the jukebox. Note: this routine may need to be run periodically from programmers' mode.

Routine Name	Description
MAGBDOS	Invoke commands via DOS Shell.
MAGBFCPY	Copy files(s) to a network location.
MAGBJBSO	Routine for Optical Technology Group jukebox.
MAGBJBSP	Routine for Pegasus jukebox.
MAGBREQ	Utility routine for requeueing background tasks, deleting and listing entries in the ^MAGQUEUE(2006.03 file.

5.4 Non-M Routines Distributed as Executable Files

DOS executable files, which are distributed, include AT-VISTA imaging software and executable imaging software.

- AT Vista imaging software: This software is distributed by Truevision and includes three files: STAGE.EXE, SERVER.OUT, and COLORBAR.EXE in the C:\STAGE directory.
- Executable imaging routines:

The file ABSTRTGA.EXE is used to create reduced size "thumbnail" image abstracts from the full resolution TGA format images captured on the workstation. It is written in C and is only supplied in an executable form that is invoked as follows from the DOS shell:

ABSTRTGA {full size image filename} {abstract filename}

```
Example: ABSTRTGA BACK1.756 BACK1.ABS
```

Chapter 6 VISTA Imaging System Files

6.1 Introduction

The **V***IST***A** Imaging System is based on the use of VA FileMan as an object-oriented database management system to store single or sequential images, and other multimedia object types. Every individual object (i.e., an image, audio clip, waveform, or scanned document) is an entry in the Image file (2005), where the object's attributes are managed. In addition, three auxiliary files are used:

- Object Type
- Network Location
- Parent Data

The objects are then related to the patients' **V***IST***A** text data through the use of pointers, both forward from the Parent Data file to the Image file, and backwards from the Image file to the Parent Data file. Software provides object capture and display functionality.

Several additional files are used by the system. These include:

- Imaging Workstations file that contains information about every workstation on the network
- Image Histologic Stain file, and a Microscopic Objective file used by anatomic pathology
- Imaging Site Parameters file
- Background Queue files which are necessary to manage abstract creation, automatic file migration (movement of image/object files between optical disk jukebox and magnetic disk), file copies, and x-ray rotation
- Image Access Log file used to track system utilization
- User Preferences File that stores personal preferences for the software configuration of the workstation.

The **V***IST***A**-PACS interface is currently in test status. It uses a number of additional files and Image file fields. The additional PACS files are not being distributed at this time. However, the Image file fields, related to the PACS interface, are included.

6.2 File List

Each of the files is described in detail below.

6.2.1 Image (2005)

Objects handled by the **V***IST***A** Imaging System currently include:

- Single images (various resolutions)
- Series of images
- Scanned documents
- Waveforms
- Motion video
- Audio files

There is a record in file 2005 for each object, containing the attributes of the object. It is distributed without data. All fields are automatically stuffed by the Imaging software - there is no user input.

Each object has a natural language Name (.01); this usually consists of the patient's name, ssn, and object description. Depending on the object type, the object will either have:

- A filename and logical location on the network (e.g., single image, graphics).
- A multiple field called Object Group, containing entries, which point back to the Image file (e.g., image series or tiled abstract display).

The Image file has the following fields:

Field Name	Description
NUMBER	The internal system number for the image.
OBJECT NAME	Each object has a natural language name; this usually consists of the patient name, social security number, and object description. The Imaging software automatically defines this field.
FILEREF	This field contains the unique image filename of the image stored on the magnetic server (and the jukebox if you have one). It is always eight characters in length, starting with the facility's 2-character Imaging namespace, with

Field Name	Description
	the remaining six characters ranging from 000001 to 999999. The extensions indicate what type of image it is: .BW for Black and White medium resolution TGA (768x486), .TGA for XRAY, .756 for 16-bit color, and TGA .PAC for ACR-NEMA TGA format images; .JPG, .TIF, and DCM for other formats. The Imaging software automatically sets this field.
DISK & VOL,MAGNETIC	This field points to the path for the network location of the stored image (i.e., the server on which it resides). After a specified time period during which the image is not viewed, the image is deleted from the magnetic server, but remains available upon request from the jukebox. It takes slightly longer to display from the jukebox, but if requested, it is moved back to the server until it is no longer being viewed. This field is set automatically by the Imaging software.
DISK & VOLUME. – ABSTRACT	This field points to the path of the network storage location for the image abstract. An abstract is a miniature copy of the captured image. If the parent image has not been viewed during the specified time period (if there is a jukebox), this file will be deleted along with the parent image file. Should the abstract be requested for viewing, it will be copied back onto the server currently being used to write captured images. The Imaging software automatically sets this field.
DISK & VOL.: WORM	This field is a pointer to the Network Location file giving the jukebox platter where the image is stored (provided there is a jukebox in the Imaging System). If it is a WORM, this file can never be deleted.
OBJECT TYPE	This field is a pointer to the Object Type file (2005.02), which defines the object type of this object (e.g., still image, black & white image, x-ray, etc.). The image type determines how

Field Name	Description
	various actions are performed (i.e., how the full resolution image is displayed, or how and when the image abstract is displayed). The Imaging software automatically sets this field at the time of image capture.
OBJECT GROUP	The object group is a multiple field pointing back to the Image file (2005). Only objects with an object type of GROUP have the Object Group field defined. These objects can be thought of as the "parent" of a set of images. Generally, instead of having their own abstract, objects of the GROUP type use the abstract of the first entry in their object group multiple. Sometimes, text will be used in place of the GROUP abstract for speed. Methods for viewing a GROUP object generally allow viewing of all the members of the group, either selectively or altogether. A good example would be a set of thirty CT scan images. Using the **V***IST***A** Display software, the tiled display of image abstracts would contain only one abstract for the group. Selecting the group object for viewing provides the user with a tiled display of the abstracts of the individual CT scan images. The user can then identify individual images for full resolution viewing.
PATIENT	This field is a pointer to the **V***IST***A** Patient file (#2), and contains the DFN of the patient to which the image or object belongs. The image or object is part of this patient's medical record. This pointer ties the image to the patient and is automatically set by the Imaging software.
PROCEDURE	This field is an abbreviation for the procedure (e.g., COL for colonoscopy, SUR for surgery, SP for surgical pathology, XRAY for radiology). The Imaging software automatically sets this field.

Field Name	Description
DATE/TIME IMAGE SAVED	This field is the date and time the image was captured. It is automatically stuffed into the file as "NOW". It is not the same as the date and time of the procedure or exam. This field is set automatically by the Imaging software.
IMAGE SAVE BY	This field is a pointer to the New Person file and thus, is equal to the DUZ of the person who logged in to capture the image. It identifies who captured or saved the image and is automatically stuffed into the Image file.
SUMMARY OBJECT	This field is reserved to indicate whether the image or object is to be used as a summary for a group of objects. For example, in a GROUP of images, normally the abstract of the first object in the group multiple is used for the integrated view display. This field will allow the user to select a summary image to be used for this purpose.
SHORT DESCRIPTION	This field allows the user to store a brief, one-line description with the image or object record.
LONG DESCRIPTION	This word processing field allows the user to describe the image at length. The user may only choose to append this long description on selected images - those, which are "classic" or "unusual" cases. It can be used to summarize a group of images which have been put together for a conference or consult. It will be used in the future to a greater extent, as options for image capture (independent of VISTA packages) are provided.
LAST ACCESS DATE	This is the date and time the image was last viewed or accessed. Each time an abstract or image is requested for viewing, this field is automatically set with the current date and time. In conjunction with the appropriate site

Field Name	Description
	parameter, this field is used for automatic file migration. That is, when an image has not been accessed within the predefined time period, it will be deleted from the magnetic server and will only be accessible from the optical disk jukebox.
GROUP PARENT	This field is used for images that are part of a group, for example a CT exam might contain 30 images. This field contains a pointer back to the Image file (2005), to the object whose type is "GROUP" that points to this object as a member of its group. A pointer to this object will be found in the Object Group multiple of the parent GROUP object.
PROCEDURE/EXAM DATE/TIME	This is the date/time of the procedure or the exam. It is obtained from the Parent Data file (i.e., the date/time of the x-ray exam, the Medical Procedure, the time the Laboratory specimen was obtained from the patient, or the date/time of the Surgical procedure). This often is not the same as the date/time the image was captured. In a long surgical procedure, the image capture time may be several hours later than the start of the operation. When a lab specimen is collected from a patient, it may be several days before images are captured from the slide. If images are initially stored on an intermediate media such as x-ray film or videotape, the capture time can be long after the procedure time.
PARENT DATA FILE#	This is a pointer to the Parent Data file and is the same as the application file or subfile's number (i.e., 130 for Surgery, 74 for Radiology, 655 for Endoscopy, and 63.08 for the Surgical Pathology subfile of the Lab data file 63). The link between the **V*IST*A** application files and the Image file (2005), is the image multiple in the application file that points to the Image file. The file structure of these application files, or parent data files, varies. The result is

Field Name	Description
	that there are subfiles of files, as well as subfiles of subfiles pointing to the Image file. A FM variable backward pointer data type will not work in this case. To allow for "backwards" navigation from the Image file to these various subfiles, and to locate the report for which this image was captured, the Parent Data file was created. It contains information about the application file or subfile, which when combined with fields 15, 17, and 18, can create the global root of the image multiple, and of the patient's report. This backwards navigation is necessary for editing of Image records, deleting unwanted images, as well as accessing the application report.
PARENT GLOBAL ROOT D0	This is the internal number (D0) for the patient entry in the application parent data file (e.g., ^RARPT(D0, ^SRF(D0, ^XMB(3.9,D0, ^MCAR(699,D0, and with the Laboratory Subfiles ^LR(D0,"SP",D1 (with lab D0 = LRDFN)).
PARENT DATA FILE IMAGE POINTER	This is the internal entry number of the image multiple of the Parent Data file that points back to the Image file (2005). With fields 15, 16, 17 and 18 and the Parent Data file, navigation can take place from the Image file back to the image pointer of the application package.
EXPORT REQUEST STATUS	This field is used when an image needs to be sent to another site. The Imaging software sets the field automatically, after checking its status. After the request is carried out, it will be automatically reset.
PATH ACCESSION NUMBER	This is the Anatomic Pathology accession number - the identifying number for the slide.
SPECIMEN DESCRIPTION	This is the description given to the specimen in the Lab Data file - the information is carried over and stuffed into the Image file.

Field Name	Description
SPECIMEN#	This is the specimen number of the slide given in the Lab Data file.
STAIN	Free text description of the Histological Stain. It is the stain used in the preparation of the specimen and is chosen by the pathologist from the Histological Stain file list.
MICROSCOPIC OBJECTIVE	Free text description of the Microscopic Objective selected by the pathologist. It identifies the power of the microscope objective used when capturing the image of the slide.
PACS UID	This field is used by the **V***IST***A**-PACS interface and is the unique 26-character image identifier of the PACS image.
RADIOLOGY REPORT	Pointer to Radiology Report file used by the PACS interface to tie the image to the correct radiology report.
PACS PROCEDURE	This field is used by the **V***IST***A**-PACS interface and is a backward pointer to the Radiology Reports file with which this radiological image is associated.
PARENT GLOBAL ROOT D1	This field is used only for laboratory images to record the third subscript of ^LR(D0,"SP",D1 as a backward pointer for use in report display and image deletion.
DESCRIPTIVE CATEGORY	This is mainly used for Document Imaging, describing the type of document image.
CLINIC	Points to the hospital location file and will be used mainly for document images. If an image is associated with a patient encounter (visit), this is the clinic associated with the appointment. The appointment date/time will be recorded in field #15, PROCEDURE/EXAM DATE/TIME.

6.2.2 Object Type (2005.02)

The Object Type file handles objects of various types. These include:

- still images
- image groups
- graphics or waveforms
- scanned documents
- audio files

Other types are expected in the future (i.e., image overlays, motion video chips, and office automation files). An object, such as an image series, may actually consist of multiple objects. In this case, the object type is Group. The Object Group multiple field is used to point to a set of objects in the Image file. Each object type has associated methods (software routines) for performing certain actions. For example, there are methods for displaying images and image abstracts. The group type is used to combine multiple objects of the same or different types to create complex objects.

There are different image types, for example:

- black and white high-resolution x-rays
- black and white ultrasound images (lower resolution)
- pseudo-color nuclear medicine scans
- medium resolution true color bronchoscopy images
- pathology images

Each type of object has a number of specific characteristics, including the methods required to display them. For example, each object type has a type name and an associated display method or window.

All accesses to objects use the file finder routine ^MAGFILE or ^MAGFILEA to find the network location needed. Different entry points of this routine will find locations of full files, abstract files, and jukebox copies of files. In addition, the network write location will be returned for image captures.

The Object Type file has the following fields:

Note: An asterisk (*), preceding the field name, indicates the field may be phased out.

Field Name	Description
NAME	Each kind of data supported by the Imaging System has an entry in the Object Type file. The Object Type file

Field Name	Description
	manages the kinds of actions which that type of object can have.
*ABSTRACT REQUIRED	This field indicates whether a separate abstract file is required for this type of object.
*ACTIONS	This field contains the kinds of actions which apply to the object type. Generally, all objects can be displayed as a full image/object and they have an abstract display method. In addition, groups of objects may have other actions such as cineloop display or tiled display.
*EDIT TEMPLATE	This field is reserved for future use for the name of the edit template that will be used to enter data pertaining to this type of object.
*PARENT	This field is reserved for future use to allow object types to inherit characteristics from a parent object type.
*CHILD CLASS	This field is reserved for future use to allow object types to inherit characteristics from other object types.

6.2.3 The Parent Data (2005.03)

Each image that is captured is associated with a procedure or test report. Depending on the service collecting the image, different types of reports will be associated. For example:

- **Medical Procedures:** Endoscopy, Dermatology, Hematology, Rheumatology, etc.
- **Anatomic Pathology:** Surgical Pathology, Cytology, Autopsy, Electron Microscopy
- **Radiology:** Xray, CT, MRI, Ultrasound, Surgery

In order to be able to display information from the associated report, references to that report are stored in the Image file. One of these references is a pointer to the Parent Report file (2005.03), which contains an entry for each package's report file that is currently supported.

The Parent Data file has the following fields:

Field Name	Description
FILE/SUBFILE NUMBER	This is the actual number of a file or subfile of a file. Some examples of the .001 field are: For the Radiology Reports file, it is 74; for Endoscopy (Medicine), it is 699; for Surgery, it is 130; and for Surgical Pathology, it is 63.08 (the subfile number of Lab Data file, 63).
FILE/SUBFILE NAME	This is the actual name of the file or subfile of a file. Some examples would be Generic Medicine, Surgery, and Surgical Pathology.
ABBREVIATION	This is the commonly used abbreviation for the file or subfile. Some examples would be SUR, ENDO, SP etc.
GLOBAL ROOT TYPE	This is used in the editing and deletion of image pointers in other files. Since the Image file (2005) is pointed to by a variety of files, a system had to be created to enable backward navigation. The global root data types or forms have been put into three groups: ROOT1 - like "^RARPT(" ; "^SRO(" ; "^LR(" ; ROOT2 - like "^XMB(3.9," ; "^MCAR(699," ROOT3 - like "^LR(D0,""SP"", SUBFILE of ^LR((where D0 = LRDFN)
FILE POINTER	This is the parent file pointing to ^DIC (in most cases it will also be the .001 field, since it will be a parent file itself. But in the case of subfiles, like the laboratory subfiles, it will not be the .001 field, but the number of the parent file. For example, the Radiology entry has 74 for the .001 field and 74 for this field. However, the Surgical Pathology entry has 68.03 for the .001 field, and 63 for the .04 field.

6.2.4 Image Audit (2005.1)

This file stores the modified image record from the Image file (2005) and serves as an audit trail for modified images. When image deletion takes place:

- The image is deleted on the imaging server (if it is there).
- The parent report file's pointer to the image file is deleted.
- The data from the image file is copied over to this file using the same IEN.
- The node is deleted from the image file.

The image residing on the WORM drive cannot be deleted, so it can always be retrieved. The field names and definitions are the same as the Image file (#2005).

6.2.5 Network Location (2005.2)

Because the Imaging System operates in a distributed environment, an object may be stored on one or more of the network storage devices. These include multiple magnetic file servers, one or more optical jukeboxes, and possibly additional network devices accessed through a gateway.

Each logical location in the Network Location file is mapped to a physical device. Every physical device on the network that will be used for objects must have at least one entry in the Network Location file.

The Operational Status field allows rapid software reconfiguration in the event of failure of one of the object storage devices.

Each network storage device has a type, such as magnetic or optical. This allows "automatic file migration," where an object resides on a fast magnetic disk until 30 days since its last access, then it is moved to slower, less expensive optical media.

Three fields in the Image file (2005) are used to indicate the storage device(s) on which the object resides. For example, an object may originally be captured to MAG1, the first magnetic server. Within seconds, an abstract is created and stored on this same device; the Disk & Vol, Abstract field will be set to MAG1 also. Next, the Image file will be copied to the optical jukebox (if present on the network), creating an immediate backup copy. The Disk & Vol, Optical field will now be set to point to the optical device used for the optical copy.

The Network Location file was designed to allow access across a gateway. This type of access has not been required at the test sites.

We recommend using names for magnetic devices that begin with the three letters, MAG, followed by sequential numbers. We recommend that images be stored in

directories named IMAGE at the first level. Do not store any files in this directory that are not objects handled by File 2005.

Logical names for Write Once Read Many (WORM) optical devices should start with the four letters, WORM.

The Network Location file has the following fields:

Field Name	Description
NETWORK LOCATION	This is the logical name of the physical location where an image is stored.
PHYSICAL REFERENCE	This is the physical network location where the image is stored. This is the Universal Naming Convention PATH for Image Storage. For example: \\ISWIMG01\IMAGE1.
TOTAL SPACE	This is the total available formatted space of this network location (device dependent).
SPACE USED	This is the amount of space, which has been used for this network location - this value is device dependent.
FREE SPACE	This is the amount of available space remaining for this network location. This value is device dependent.
OPERATIONAL STATUS	This field tells the Imaging software whether this network location, where images are stored, is on-line. The default is on-line if the field is null.
STORAGE TYPE	This field describes the storage device type of this network location. It should be MAGNETIC for a magnetic disk server. Jukeboxes should be WORM-DG for Data General Jukeboxes under Open NetWare, WORM-PDT for Pegasus Jukeboxes, or WORM-OTG for Optical Technology Group.

6.2.6 Image Histologic Stain (2005.4)

Anatomic Pathology specimens are generally stained. There is a field in the Image file (2005) that indicates the stain that was used on the slide from which the image was captured. This file is used to display a selection of Histologic Stains available for selection during an image capture.

The Image Histologic Stain file contains the following fields:

Field Name	Description
NAME	This is the name of the Histological stain used in Anatomic Pathology.
MNEMONIC	This field is used for other names that the Pathologists might use to specify a stain, and is available as a lookup name.

6.2.7 Microscopic Objective (2005.41)

The Microscopic Objective file contains a list of choices of microscope power available for selection during an Anatomic Pathology image capture.

The Microscopic Objective fields are:

POWER

This is the microscopic power used in the Anatomic Pathology laboratory.

6.2.8 Image Background Queue (2006.03)

The Image Background Queue file is a holding file for all the entries to be processed by the Background Processor.

The Image Background Queue file contains the following fields:

Field Name	Description
QUEUE NAME	Name of the queue holding the entry.

Field Name	Description
USER	Pointer to the user creating the entry in the queue
SYSTEM VOLUME GROUP ID	The identification of the system used to create the entry in the queue.
REQUEST DATE & TIME	The date and time that the entry was placed into the queue.
COMPLETION STATUS	The status of the handling of the request by the Background Processor. The field is null until the entry is processed in the background. A positive value indicates a successful completion of the request. A negative value indicates a failure to complete the request. Explanatory text follows the numeric status in this field.
COMPLETION DATE & TIME	The date and time that the Background Processor finished the request.
QUEUE DATA ITEM 1	First parameter passed from the foreground to the Background Processor.
QUEUE DATA ITEM 2	Second parameter passed from the foreground to the Background Processor.
QUEUE DATA ITEM 3	Third parameter passed from the foreground to the Background Processor.
QUEUE DATA ITEM 4	Fourth parameter passed from the foreground to the Background Processor.
QUEUE DATA ITEM 5	Fifth parameter passed from the foreground to the Background Processor.

6.2.9 Image Background Queue Pointer (2006.031)

The Background Processor uses three files:

1. **Queue** (2006.03)
2. **Queue Pointer** (2006.031)
3. **Jukebox** (2006.032)

There are five different tasks that can be performed by the background processor:

1. **ABSTRACT** -- create a small version of an image
2. **EXPORT** ---- copy an image to an export directory so that it can be used outside the imaging system
3. **IMPORT** ----copy an image from an import directory into the imaging system
4. **JUKEBOX** ---copy an image from hard disk to the jukebox
5. **JBTOHD** ----copy an image from the jukebox to the hard disk

There is a single Input Queue file for all the requests, with a cross-reference to request type. The background processor processes the entries in a prioritized first-in first-out fashion, and uses the Queue Pointer file to record its progress. The background processor uses the Jukebox file for device-specific information. The jukebox platters are logically placed into the Network Location file, and are pointed to by the Jukebox file and the Image file. Jukeboxes, which can be configured as a single volume, only have a single entry in the network location file.

Field Name	Description
QUEUE NAME	Name of the queue holding the entry.
QUEUE POINTER	Pointer to the entry in the queue.

6.2.10 Jukebox (2006.032)

The Jukebox file contains information about the jukebox. Some of the fields are not currently used but are reserved for future development. Review the Imaging Installation Manual for instructions on Jukebox installation and making entries into this file.

The Jukebox file contains the following fields:

Field Name	Description
JUKEBOX NAME	This is the name for the jukebox. It is typically the name of the manufacturer of the jukebox hardware and/or software.
JUKEBOX DEVICE	This is the universal Naming Convention (UNC) for your Jukebox Share (i.e., \\WASHIMGJB1\IMAGE1); Format required: \\servername\sharename\.
CURRENT WRITE PLATTER	New files are written to this platter of the jukebox. This field is a pointer to the Network Location file (2005.2).
NUMBER OF CARTRIDGES	This field contains the number of cartridges that have been entered into the jukebox. The field is not decremented when cartridges are removed.
PERCENT FREE SPACE	The minimum free space specifies the percentage of the platter to be kept empty. For example, if it is 10, then 90% of the platter can written to before swapping to the next platter.
LAST TIMESTAMP FOR SIZE	The Background Processor must periodically check the amount of free-space on the current jukebox platter. This field records the last time that this check was performed.
JB VOLUME SIZE ROUTINE	The Background Processor will invoke this MUMPS routine to determine how much space is used, and how much is still available.
USE SUBDIRECTORIES	The Data General Jukebox requires sub-directories of the form 1A\IMAGE\NN\<IMAGE FILE>. The Pegasus jukebox does not require the sub-directories.
JUKEBOX VOLUME NAME	This is the volume name for the jukebox. For Pegasus jukebox software, it is "OJMI" (Optical Jukebox Management Interface).

Field Name	Description
MEDIA NAME	This identifies the kind of jukebox cartridge. Use "WORM-PDT" for Pegasus WORM cartridges, "WORM-DG" for Data General WORM cartridges, and "WORM-OTG" for Optical Technology Group Systems.

6.2.11 Imaging Site Parameters (2006.1)

The Imaging Site Parameter file contains those variables which are site specific, and which are necessary for the Imaging Software to perform properly. Most of the fields have MUMPs cross-references with which they are associated that are used by the software for quick access to the specific data. Some of the fields defined may not be in use presently, but are reserved for future development. Review the Imaging Installation Manual for instructions on making entries into this file.

The Imaging Site Parameter file contains the following fields:

Field Name	Description
INSTITUTION NAME	This is the institution/facility name for which these site parameters apply. When using the Define Site Parameters option, the name for your facility is taken from the Kernel Site Parameters file and automatically defined as the name (.01) field for this file. You may then edit it as you wish, and continue defining the remaining fields. However, it is important to populate the Network Location and the Imaging Workstations files first, before undertaking this one. The fields contained in this file are those which are site specific and differ from site to site.
INITIAL NAMESPACE	The Image file name is 8 characters beginning with 2 characters. Each facility has its own unique two-character namespace (e.g., Washington is W0, Baltimore is B0).

Field Name	Description
IMAGE NETWORK WRITE LOCATION	This field is a pointer to the Network Location file defining the current NETWORK WRITE location for captured images. Enter the server that you have designated as the current write server. There is a separate option to edit this field when this server either "goes down" or runs out of space. There is a cross-reference on the field ^MAG(2006.1,"ARITE")=X where X equals the Network Write Location pointer. The software checks this node before writing the Image file to disc.
*IMAGE DTIME	This is an alternate DTIME, especially for Image Capture options where the procedure may last for a couple of hours. Facilities may differ as to how long they want to define this Image Capture DTIME - we have given them this flexibility. TO BE USED IN FUTURE DEVELOPMENT.
*IMAGE CAPTURE DEFAULT	S for Save and N for No default. TO BE USED IN FUTURE DEVELOPMENT.
*TASKMAN VOLUME SET	TO BE USED IN FUTURE DEVELOPMENT.
IMAGE NETWORK EXPORT LOCATION	This field is a pointer to the Network Location file defining the NETWORK EXPORT directory. When the software makes an export request, the file is copied over to this directory.
IMAGE NETWORK IMPORT LOCATION	Analogous to the Export location, the image IMPORT location is the directory specified to receive incoming images. This points to the Network Location file, and a MUMPS cross-reference permits quick access to the site-specific network location.
PACS INTERFACE SWITCH	This field is "NULL" if there is NO PACS SYSTEM. If there is a PACS System, this field serves as a switch to turn the PACS interface ON or OFF. If it is OFF, no messages will be transmitted from DHCP to PACS; if ON, then these messages will be transmitted. A special system manager's option allows the rapid switching of the interface.

Field Name	Description
PACS DIRECTORY	This is a pointer to the Network Location file giving the location where PACS images are written by the Commercial PACS SYSTEM, and where **V***IST***A** first reads them.
PACS IMAGE WRITE LOCATION	This field points to the Network Location file and informs the PACS system of the current write drive. PACS images are first read from the PACS directory, and later converted and copied to the network location specified by this field.
*JUKEBOX DEVICE	This field is not presently used.
*TOTAL #PLATTERS	This field is not presently used.
*CURRENT PLATTER	This field is not presently used.
*TIME LAST LOOKED	This field is not presently used.
*VERIFY IMAGE FILE	This field is not presently used.
*ECG IMPORT DIRECTORY	This field is not presently used.
*ECG DEFAULT DISPLAY	This field is not presently used.
*REMOTE VOLUME GROUP	This field is not presently used.
*TRACK ABSTRACT ACCESSES	This field is not presently used.
*IMAGECOM BRIDGE FILE LOCATION	This field is not presently used.
DAYS SINCE LAST ACCESS CUTOFF: 90	All images that have not been accessed in the last X days (where X is the ACCESS DAYS DELETE CUTOFF) will be removed from the magnetic drive during file migration procedures.

Field Name	Description
PACS ACCESS DAYS DELETE CUTOFF: 30	All PACS images that have not been accessed in this many days will be removed from magnetic storage by automatic file migration procedures.
NET USERNAME	This field contains the network username for the Imaging users to signon to the network.
NET PASSWORD	This field contains the network password for the NET USERNAME entity. The password is encrypted.
NET UPDATE DIRECTORY	This is the directory where automatic updates will be executed. This field points to the Network Location file (2005.2).
NET UPDATE TEST DIRECTORY	This is the directory where Imaging releases to be tested are copied. Workstations with the "WRKS RUNS TEST UPDATES" field set to True will check this directory for the latest Imaging software to test. A site can limit the number of workstations that will use this procedure to test new versions of the software. When a site is satisfied with the new version, it copies MAGSETUP.EXE to the NET UPDATE DIRECTORY where all workstations will be updated. This field points to the Network Location file (2005.2).
JUKEBOX DEFAULT	This field will contain the default jukebox device, if more than one jukebox exists. This field points to the Jukebox file (2006.032).
DEFAULT USER PREFERENCE	This field contains the user preference settings for first time users of the Imaging System. This field points to the Imaging User Preference file (2006.18).
USE CAPTURE KEYS	This field controls whether the Image capture security keys will be used. If set to true, the appropriate keys must be given for the appropriate Image capture. "Capture" functionality and Procedure lookup functionality will not be allowed from the capture window if the user does not have the proper security keys allocated.

6.2.12 User Preferences File (2006.18)

This file keeps user preferences for the Imaging System windows (i.e., window placement: top, left, height, width, if it is standalone or MDIChild; font for reports; and more to be added for future development).

Field Name	Description
DESCRIPTION	The preference style name.
USER	This field will contain the name of the user. This field is a pointer to the New Person file (200).
ABS COUNT	The number of abstract images to be displayed. Will be used in future development.
GROUP ABS COUNT	The number of abstract images to be displayed in a group.
MAIN STYLE	Set of codes defining the type of window style for the main window. Will be used in future development.
MAIN LEFT	The main window, left-edge settings.
MAIN TOP	The main window, top-edge settings.
MAIN WIDTH	The main window width settings.
MAIN HEIGHT	The main window height settings.
ABS STYLE	Set of codes defining the type of window style for the abstract image window. Will be used in future development.
ABS LEFT	The left abstract window settings.
ABS TOP	The top abstract window settings.
ABS WIDTH	The abstract window width settings.
ABS HEIGHT	The abstract window height settings.
GROUP STYLE	Set of codes defining the window style for a group of abstracts. Will be used in future development.

Field Name	Description
GROUP LEFT	The group window, left-edge settings.
GROUP TOP	The group window, top-edge settings.
GROUP WIDTH	The group window width settings.
GROUP HEIGHT	The group window height settings.
FULL STYLE	Set of codes defining the window style for a full image display. Will be used in future development.
FULL LEFT	The full image window, left-edge settings.
FULL TOP	The full image window, top-edge settings.
FULL WIDTH	The full image window width settings.
FULL HEIGHT	The full image window height settings.
REPORT STYLE	Set of codes defining the window style for a report display. Will be used in future development.
REPORT LEFT	The report window, left-edge settings.
REPORT TOP	The report window, top-edge settings.
REPORT WIDTH	The report window width settings.
REPORT HEIGHT	The report window height settings.
REPORT FONT	Set of codes for the fonts to be used in report display.
REPORT FONT SIZE	The font size for report display.
DOC STYLE	Set of codes defining the window style for a document. Will be used in future development.
DOC LEFT	The document window, left-edge settings.
DOC TOP	The document window, top-edge settings.
DOC WIDTH	The document window width settings.
DOC HEIGHT	The document window height settings.

Field Name	Description
ABS IMAGE WIDTH	Will be used in future development.
ABS IMAGE HEIGHT	Will be used in future development.
GROUP IMAGE WIDTH	The group image window width settings.
GROUP IMAGE HEIGHT	The group image window height settings.
IMAGEGRID STYLE	Set of codes defining the window style for an image grid. Will be used in future development.
IMAGEGRID LEFT	The image grid window, left-edge settings.
IMAGEGRID TOP	The image grid window, top-edge settings.
IMAGEGRID WIDTH	The image grid window, width settings.
IMAGEGRID HEIGHT	The image grid window, height settings.
DOC FITWIDTH	Whether the document should fit the width defined.
DOC FITHEIGHT	Whether the document should fit the height defined.
DOC BANDINGMODE	Set of codes defining the banding mode.
ABS SHOW	Whether to display abstracts.
IMAGEGRID SHOW	Whether to display the image grid.
TELELKP	Will be used in future development.
VIEWJBOX IMAGES	Controls whether images from the jukebox will be displayed.
REVERSE ORDER	Display images in reverse-chronological order.
RADEXAMS STYLE	Set of codes defining the window style for a Radiology Exam display. Will be used in future development.
RADEXAMS LEFT	The radiology exams window, left-edge settings.
RADEXAMS TOP	The radiology exams window, top-edge settings.
RAD EXAMS WIDTH	The radiology exams window, width settings.

Field Name	Description
RAD EXAMS HEIGHT	The radiology exams window, height settings.
RADEXAMS SHOW	Radiology exams view preference.
SMTP/POP SERVER ADDRESS	The default SMTP/POP3 server to send and receive emailed images. It must be a server that can handle SMTP and POP3 mail protocols. Will be used in future development.
IMAGE EMAIL ADDRESS	The email address of the person who will receive the images. Will be used in future development.
ALIAS	The name to appear on the message header. Will be used in future development.
POP3 USERNAME	The account user name on the POP# server where the user will receive image mail. Will be used in future development.
POP3 PASSWORD	The POP3 password for the user to login and retrieve messages from the POP3 server. Will be used in future development.
PCANYWHERE SCRIPT NAME	The user's script name to send images via PCanywhere. Will be used in future development.
LAST TEN PATIENTS	The last ten patients the user referenced.

6.2.13 Imaging Users (2006.19)

This file contains the names of domains using the imaging system and the beginning two characters used for image file names created at each site.

Note: The information in this file should not be edited. This file is used during initial setup of the Imaging Site Parameter file.

The Imaging Users file contains the following fields:

Field Name	Description

Field Name	Description
DOMAIN NAME	This is the domain name for the site. It cannot be altered, except by programmers.
IMAGE FILE NAMESPACE	This is the two-character code assigned to this site. These characters are used as the first two characters of image files created by this site.

6.2.14 Imaging Workstations (2006.8)

The Imaging Workstations file is designed to track imaging workstation:

- locations
- volume set names
- component serial numbers
- display modes

It points to the Hospital Location file and has other identifying fields.

The fields are:

Field Name	Description
NAME	This is the three-letter name, beginning with "I", that is given to a particular workstation. This identifying name remains with the system.
ROOM/IMAGING FUNCTION	This field describes the location's primary function in relation to the imaging workstation (i.e., what function the workstation serves).
SYSTEM MAKE	This is an optional field where you may enter the system model name (e.g., DEC, EVEREX, etc.). If a system is failing in the field, it may be useful to quickly identify the model, and create a history of "problems" for that particular model.
EQUIPMENT ITEM	The equipment item from the Engineering Inventory file.

Field Name	Description
ROOM NUMBER	This is the exact room number where the imaging workstation is located. It is a pointer to the Engineering Space file (6928) which holds other data elements relevant to this room, such as the Service to which it belongs.
*DISPLAY MODE	This field will be phased out.
*WINDOWS IMAGE DISPLAY	This field will be phased out.
*STATUS	This field is used to designate the status of the workstation/system. It is either in service, or out of service awaiting repairs, or being serviced. This field will be phased out.
*VISTA BOARD PRESENT	This field will be phased out.
*DOME BOARD PRESENT	This field will be phased out.
*PREFERRED REMOTE VOLUME GROUP	This field will be phased out.
BACKGROUND PROCESSOR	This field identifies the Background Processor system. It should be set to NULL or NO for Imaging Workstations.
ABSTRACT	Indicates that the Background Processor is to create Image abstracts.
JUKEBOX	Indicates that the Background Processor is to copy file to the jukebox.
JBTOHD	Indicates that the Background Processor is to copy files from the jukebox to the hard disk.
EXPORT	Indicates that the Background Processor is to EXPORT files from the Imaging System.
IMPORT	Indicates that the Background Processor is to IMPORT files into the Imaging System.

Field Name	Description
EXPORT64	Indicates that the Background Processor is to BASE64 encode while exporting.
IMPORT64	Indicates that the Background Processor is to import BASE64 encoded messages.
*FILECOPY	This field will be phased out.
DELETE	Indicates that the background Processor is to delete image files.

6.2.15 Imaging Window Workstation (2006.81)

The Imaging Windows Workstations file is used by the Imaging auto-update functions. This file will contain all the workstations that have been identified to automatically update its Imaging software. The Imaging support person at the Medical Centers should periodically review this file to ensure that all the workstations have the latest code.

Note: The information in this file should not be edited.

The file contains the following fields.

Field Name	Description
NAME	The Windows computer name for the workstation.
LAST USER	The last user to logon to the Imaging VISTA software from this workstation.
LAST LOGON DTTM	The Date and time that a user logged on to the Imaging Windows application from this workstation.
LAST LOGOFF DTTM	The last time a user logged off the Imaging Windows application from this workstation.
CAPTURE APP DTTM	The date and time the Imaging Capture application was updated on this workstation.
DISPLAY APP	The date and time the Imaging Display application was

Field Name	Description
DTTM	updated on this workstation.
LOCATION OF WRKS	The location of the workstation as defined in the MAG.INI file, Section: [SYS_SiteParam] ENTRY: Location=

6.2.16 Image Access Log (2006.95)

The Image Access Log file will log all users and the images accessed by them.

This file contains the following fields:

Field Name	Description
NAME	This field contains a unique, increasing number (equal to internal subscript number for entry) for the image access that has been logged.
ACCESS TYPE	This field describes the type of access made to the image or page of image abstracts.
USER	This field indicates the user who accessed the image or page of abstracts.
IMAGE	This field contains a pointer to the image that was accessed.
USER INTERFACE SOFTWARE	This field indicates the software package that was being used to access the image.
WORKSTATION	This field indicates the workstation on which the image access was made.
ACCESS DATE/TIME	This field holds the date and time of the image access.
PATIENT	This field indicates the patient whose images were accessed (optional).
IMAGE COUNT	Number of images accessed for abstract accesses.

6.2.17 Image Teleconsult file (2005.15)

This file will track teleconsultation requests. The fields for this file are:

Field Name	Description
Patient Name	Patient's name as registered on the sending system.
Patient SSN	Patient's SSN as registered on the sending system.
Date/Time of Request	The date/time that the request was entered on the sending system.
Date/Time Received	The date/time that this entry is made.
Date/Time Read	The date/time that the consultation films were read.
Referring Provider	The name of the individual to be contacted with results or questions.
Referring Provider Telephone Number	Telephone number for referring provider.
Status	Status of teleconsultation: Pending (not yet read), Completed (consultation finished), or Hold (trying to contact provider or other delay).
Summary/Diagnosis	80-character summary of the results of a teleconsultation.
Images	Multiple field pointing to images that are part of this teleconsult.
Findings	Findings of the consulting physician related to this case.
Urgency	This field indicates how quickly the results are needed.
Case Number	Radiology case number at sending site.

Field Name	Description
Patient Pointer	If patient is on receiving system, the pointer to the correct patient file entry will be in this field.

6.2.18 MAG Descriptive Categories (2005.81)

This file is pointed to by the Image file (2005) and the Image Audit file (2005.1).

NAME	Descriptive category name which may be used for retrieving lists of images (e.g., consent form, encounter form, bill, check, etc.).

6.3 File Security

The following VA FileMan file protection has been assigned to the files exported by the VISTA Imaging software. No access to any users for these files are recommended for sites using Kernel Part III software. All updating to these files is done via the GUI interface. The following files can be updated using the Imaging System Manager menu (will require the MAG SYSTEM security key): Imaging Site Parameters, Jukebox, and Network Locations.

File Security Codes JUN 24,1997 13:53 PAGE 1

NUMBER	NAME	DD ACCESS	RD ACCESS	WR ACCESS	DEL ACCESS	LAYGO ACCESS
2005	IMAGE	@				
2005.02	OBJECT TYPE	@				
2005.03	PARENT DATA FILE	@	@	@	@	@
2005.1	IMAGE AUDIT	@	#	#	#	#
2005.15	IMAGE TELECONSULT	@	@	@	@	@
2005.2	NETWORK LOCATION	@			@	
2005.4	IMAGE HISTOLOGICAL S	@			@	
2005.41	MICROSCOPIC OBJECTIV	@			@	
2005.81	MAG DESCRIPTIVE CATE	@	@	@	@	@
2006.03	IMAGE BACKGROUND QUE	@	#	#	#	#
2006.031	IMAGE BACKGROUND QUE POINT	@	#	#	#	#
2006.032	JUKEBOX FILE	@	#	#	#	#
2006.1	IMAGING SITE PARAMETERS	@	@	@	@	@
2006.18	IMAGING USER PREFERENCE	@			@	
2006.19	IMAGING USERS	@			@	
2006.8	IMAGING WORKSTATIONS	@			@	
2006.81	IMAGING WINDOWS WORKSTATI	@	@	@	@	@
2006.95	IMAGE ACCESS LOG	@	@	@	@	@

6.4 File Diagram and Detailed Information

A detailed File Diagram will be found in section 12.2.

Chapter 7 Exported Options

7.1 Introduction: INI File Setup and Configuration of Workstations

INI files are DOS files with the extension .INI, such as WIN.INI and MOUSE.INI, that contain initialization information for programs. Initialization refers to the parameters that control the way a program is initially launched. They also customize the application to accommodate workstation-specific characteristics, such as the type of capture hardware installed (Refer to Installation Guide for further details). The INI files are set up initially when the software is first installed on the workstation. The Installation manual has window examples of these files.

Note: Entries for these file should be made via the MAGSYS.EXE routine located in directory VISTA\IMAGING.

7.2 MAG.INI File Entries

[Locations]

LOCAL=DHCPSERVER
LOCALPORT=9200
REMOTE=NONE
REMOTEPORT=9200

[InputType]

Lumisys75=TRUE
Lumisys150=TRUE
Vista=TRUE
Meteor=TRUE
Vidar=TRUE
TWAIN=TRUE
Import=TRUE
SCANECG=TRUE
ScannedDocument=TRUE
VistaInteractive=TRUE
Default=Lumisys75

[choice_InputType_Default]

1=Lumisys75
2=Lumisys150
3=Vista

4=VistaInteractive
5=Meteor
6=Vidar
7=Import
8=TWAIN
9=SCANECG
10=ScannedDocument

[Specialty]

Laboratory=TRUE
Medicine=TRUE
Radiology=TRUE
Surgery=FALSE
None=TRUE
Default=MED

[Choice_Specialty_Default]

1=MED
2=RAD
3=LAB
4=SUR
5=NONE

[ImageType]

True Color TGA=TRUE
True Color JPG=TRUE
256 Color=TRUE
Xray=TRUE
Black and White=TRUE
Document TIF Uncompressed=TRUE
Document TIF G3 FAX=TRUE
Motion Video=TRUE
Audio=TRUE
Default=Xray

[choice_ImageType_Default]

1=True Color TGA
2=True Color JPG

3=256 Color
4=Xray
5=Black and White
6=Document TIF Uncompressed
7=Document TIF G3 FAX
8=Motion Video
9=Audio

[SaveOptions]

default=GROUP

[choice_SaveOptions_default]

1=GROUP
2=SINGLE

[FileSvr]

NT=TRUE
Novell=TRUE

[Import Options]

Type=Copy to Server
DefaultImportDir=c:\windows
DefaultMask=*.BMP
ShowSize=TRUE
ShowDate=TRUE

[Choice_Import Options_Type]

1=Copy to Server
2=Convert to TGA
3=Convert File Format to Default

[SYS_SiteParam]

ID=MAGINITEMPLATE
Location=MAGINITEMPLATE

ABScreated=True
SaveBIG=FALSE
ABSSentToRemote=TRUE
ABBREV=I2
DISPJBABS=FALSE
ORDER=FALSE
LOGACTION=FALSE
MUSE=FALSE

[RadiologyDisplay]

DUAL=FALSE
VIEW2K=False
VIEWABS=True
DOME=FALSE
DISPLAYSW=RAD

[SCAN]

ColorScan 256=FALSE

[TeleConsult]

AWDir="c:\Program Files\PCanywhere"

[LOGIN]

LoginOnStartup=TRUE

7.3 Imaging System Manager Menu

The Imaging System Manager menu contains the most commonly used system manager functions. Please review the Installation manual for examples on setting up these files.

Menu Diagram for MAG SYS MENU

```
Imaging System Manager Menu  [MAG SYS MENU]  **Locked: MAG SYSTEM **
 DS  Define Imaging Site Parameters  [MAG SYS-DEFINE SITE PARAMETERS]
 IW  Edit Image WRITE LOCATION only.  [MAG SYS-EDIT WRITE LOCATION]
 WF  Enter/Edit Workstation File  [MAG SYS-ENTER/EDIT WORKSTATION]
 NT  Enter/Edit Network Location  [MAG SYS-ENTER/EDIT NETWORK LOC]
 LS  Edit Network Location STATUS  [MAG SYS-EDIT NET LOC STATUS]
```

Chapter 8 Cross-references

8.1 Introduction

The cross-references shown in this chapter are supplementary to the standard "B" cross-reference found on the .01 field of each file and multiple.

8.2 Image File (2005)

```
(2005,1) FILEREF                                    0;2
Xref 1:  2005^E
Set: S ^MAG(2005,"E",$E(X,1,30),DA)=""
Kill: K ^MAG(2005,"E",$E(X,1,30),DA)
Com: DOS IMAGE file cross-reference.
Desc: This cross-reference produces a list of unique entries as the DOS file
reference associated with each image/object is by definition unique.  This
cross-reference is used by Multimedia Mail to see whether an image already is
in the Image file.

(2005,5) PATIENT                                    0;7
Xref 1:  2005^AC
Set: I $P(^MAG(2005,DA,0),U,10)="" S ^MAG(2005,"AC",$E(X,1,30),DA)=""
Kill: I $P(^MAG(2005,DA,0),U,10)="" K ^MAG(2005,"AC",$E(X,1,30),DA)
Desc: This cross-reference will produce a simple "AC" with DFN and time of
capture.  It will NOT include any image record that is PART of a group.  The
consequence is that the "AC" cross-reference will only contain the records
belonging to "parents" and independent members". Since it will not contain
"members" any integrated view function will present abstracts of independent
members, and the first member of any group object.

Xref 2:  2005^APPXDT^MUMPS
Set: I $P(^MAG(2005,DA,0),U,10)="" D SETPPXD^MAGUXRF
Kill: I $P(^MAG(2005,DA,0),U,10)="" D KILPPXD^MAGUXRF
Com: PATIENT, DATETIME, PROCEDURE & PATIENT, PROC, DATETIME
Desc: This MUMPS routine will create two cross-references to relate the
following variables: DFN (patient), Procedure, Date/time of Procedure or
secondly: DFN (patient), Date/time of Procedure, Procedure  NOTE: Any record
that is a child of a parent, i.e., member of a group, is NOT included in the
cross references; only independent members or parents.
This cross reference set is the same for the Fields #6 (Procedure) and #15
(Procedure date and time). For all three of these fields: #5, #6, #15 the set
and kill of the cross-reference produce the same result. The only difference
is the "X" used which is dependent upon which field.  Each set produces two
cross-references, that differ only by the order of the variables as described
above. Other descriptions will be referred to this one to explain the purpose
of the Cross-reference.
The cross-references produced have the following structure:
                    ^MAG(2005,"APPXDT",DFN,PROC,DT,DA)=""
                    ^MAG(2005,"APDTPX",DFN,DT,PROC,DA)=""

(2005,6) PROCEDURE                                  0;8
Xref 1:  2005^APPXDT6^MUMPS
```

```
Set: I $P(^MAG(2005,DA,0),U,10)="" D SETPPXD6^MAGUXRF
Kill: I $P(^MAG(2005,DA,0),U,10)="" D KILPPXD6^MAGUXRF
Com: PATIENT, DATETIME, PROCEDURE & PATIENT, PROC, DATETIME
Desc: This routine creates the following cross-references:
                          ^MAG(2005,"APPXDT",DFN,PROC,RDT,DA)=""
                          ^MAG(2005,"APDTPX",DFN,,RDT,PROC,DA)=""
Please refer to the documentation for cross-reference #2, the "APPXDT" index,
of the Patient field #5.

(2005,15) PROCEDURE/EXAM DATE/TIME                2;5
Xref 2:  2005^APPXDT5^MUMPS
Set: I $P(^MAG(2005,DA,0),U,10)="" D SETPPXD5^MAGUXRF
Kill: I $P(^MAG(2005,DA,0),U,10)="" D KILPPXD5^MAGUXRF
Com: PATIENT, DATETIME, PROCEDURE & PATIENT, PROC, DATETIME
Desc: This routine entry point will create two cross-references:
                         ^MAG(2005,"APPXDT",DFN,PROC,RDT,DA)=""
                         ^MAG(2005,"APDTPX",DFN,RDT,PROC,DA)=""
Please refer to the documentation describing this cross-reference under the
Patient field (#5), cross-reference #2, the "APPXDT" index.

(2005,19) EXPORT REQUEST STATUS                   2;9
Xref 1:  2005^AEXPORT^MUMPS
Set: I X S ^MAG(2005,"AEXPORT",DA)=""
Kill: K ^MAG(2005,"AEXPORT",DA)
Com: IMAGE EXPORT REQUEST
Desc: Used as a signal to request an image to be copied from the image
directory to the export directory.  The cross-reference is set when the
request is made and killed when the image has been copied over for export.

(2005,60) PACS UID                                PACS;1
Xref 1:  2005^P
Set: S ^MAG(2005,"P",$E(X,1,30),DA)=""
Kill: K ^MAG(2005,"P",$E(X,1,30),DA)
Com: PACS UNIVERSAL IDENTIFIER
Desc: PACS Universal Identifier used only by systems that are interfaced to a
radiology PACS system via the DHCP Imaging ACR-NEMA  (DICOM) Interface.
```

8.3 Object Type - File: 2005.02

```
(2005.02,1) ACTIONS                               1;0     (Multiple)
Xref 2:  2005.02^AC^MUMPS
Set: D SETACT^MAGUXRF
Kill: D KILLACT^MAGUXRF
Desc: Sets Object AC cross-reference for displaying abstracts and objects.
```

8.4 Image Audit - File: 2005.1

```
(2005.1,1) FILEREF                                0;2
Xref 1:  2005.1^E
Set: S ^MAG(2005.1,"E",$E(X,1,30),DA)=""
Kill: K ^MAG(2005.1,"E",$E(X,1,30),DA)
Com: DOS IMAGE file cross-reference.
Desc: This cross-reference produces a list of unique entries as the DOS file
reference  associated with each image/object is by definition unique.  This
```

```
cross-reference is used by Multimedia mail to see whether an image already is
in the image file.

(2005.1,5) PATIENT                                  0;7
Xref 1:  2005.1^AC
Set: I $P(^MAG(2005.1,DA,0),U,10)="" S ^MAG(2005.1,"AC",$E(X,1,30),DA)=""
Kill: I $P(^MAG(2005.1,DA,0),U,10)="" K ^MAG(2005.1,"AC",$E(X,1,30),DA)
Desc: This cross-reference will produce a simple "AC" with DFN and time of
capture.  It will NOT include any image record that is PART of a group.  The
consequence is that the "AC" cross-reference will only contain the records
belonging to "parents" and "independent members".
```

8.5 Image Histological Stain - File: 2005.4

```
(2005.4,.02) MNEMONIC                               0;2
Xref 1:  2005.4^BB
Set: S ^MAG(2005.4,"BB",$E(X,1,30),DA)=""
Kill: K ^MAG(2005.4,"BB",$E(X,1,30),DA)
```

8.6 Image Background Queue - File: 2006.03

```
(2006.03,1) QUEUE NAME                              0;2
Xref 1:  2006.03^C
Set: S ^MAGQUEUE(2006.03,"C",$E(X,1,30),DA)=""
Kill: K ^MAGQUEUE(2006.03,"C",$E(X,1,30),DA)
```

8.7 Imaging Site Parameters - File: 2006.1

```
(2006.1,.02) INITIAL NAMESPACE                      0;2
Xref 1:  2006.1^ALTR^MUMPS
Set: S ^MAG(2006.1,"ALTR")=X
Kill: K ^MAG(2006.1,"ALTR")
Com: FACILITY'S INITIAL IMAGE NAMESPACE
Desc: By accessing the node ^MAG(2006.1,"ALTR")=X, where X equals the first
two letters of the DOS image file, the site-specific namespace obtained and
the next image record can be defined.

(2006.1,.03) IMAGE NETWORK WRITE LOCATION           0;3
Xref 1:  2006.1^ARITE^MUMPS
Set: S ^MAG(2006.1,"ARITE")=X
Kill: K ^MAG(2006.1,"ARITE")
Com: IMAGE NETWORK WRITE LOCATION
Desc: By accessing the node: ^MAG(2006.1,"ARITE")=X, the current image write
location pointer is obtained (X).  The field MUST be edited when the server
to which the images are being written is changed to another server.

(2006.1,.07) IMAGE NETWORK EXPORT LOCATION          0;7
Xref 1:  2006.1^AEXPORT^MUMPS
Set: S ^MAG(2006.1,"AEXPORT")=X
Kill: K ^MAG(2006.1,"AEXPORT")
Com: IMAGE NETWORK EXPORT DIRECTORY
```

```
Desc: The node, ^MAG(2006.1,"AEXPORT")=X, where X is a pointer to the Network
Location file, identifies the location for the export of images.

(2006.1,.08) IMAGE NETWORK IMPORT LOCATION        0;8
Xref 1:  2006.1^AIMPORT^MUMPS
Set: S ^MAG(2006.1,"AIMPORT")=X
Kill: K ^MAG(2006.1,"AIMPORT")
Com: IMAGE NETWORK IMPORT LOCATION
Desc: The node ^MAG(2006.1,"AIMPORT")=X ,where X equals the network location
to which images are imported, enables quick determination of this directory.

(2006.1,1.01) PACS INTERFACE SWITCH               PACS;1
Xref 1:  2006.1^APACS^MUMPS
Set: I X'="" S ^MAG(2006.1,"APACS")=X
Kill: K ^MAG(2006.1,"APACS")
Com: PACS INTERFACE STATUS
Desc: This node, ^MAG(2006.1,"APACS")=X, where X equals the status of the
interface, tells the system if the interface is present, and on or off:
                  $G(^MAG(2006.1,"APACS"))="" : NO PACS INTERFACE
                  $G(^MAG(2006.1,"APACS"))=0  : PACS Interface is OFF
                  $G(^MAG(2006.1,"APACS"))=1  : PACS Interface is ON
If it does not exist, the node is not defined.  A value of 0 indicates the
interface is off, a value of 1 means is it on.

(2006.1,1.02) PACS DIRECTORY                      PACS;2
Xref 1:  2006.1^APXDR^MUMPS
Set: S ^MAG(2006.1,"APXDR")=X
Kill: K ^MAG(2006.1,"APXDR")
Com: PACS NETWORK WRITE LOCATION
Desc: The node ^MAG(2006.1,"APXDR")=X, where X is a pointer to the Network
Location file defining the path to which the PACS images are written.

(2006.1,1.03) PACS IMAGE WRITE LOCATION           PACS;3
Xref 1:  2006.1^APXWRITE^MUMPS
Set: S ^MAG(2006.1,"APXWRITE")=X
Kill: K ^MAG(2006.1,"APXWRITE")
Com: PACS NETWORK WRITE LOCATION
Desc: Creates a node, ^MAG(2006.1,"APXWRITE")=X, where X is a pointer to the
Network Location file defining the path from which the PACS images are
written.

(2006.1,2.01) JUKEBOX DEVICE                      JBX;1
Xref 1:  2006.1^AJBXDEV^MUMPS
Set: S ^MAG(2006.1,"AJBXDEV")=X
Kill: K ^MAG(2006.1,"AJBXDEV")
Com: JUKEBOX DEVICE
Desc: If a Jukebox exists, ^MAG(2006.1,"AJBXDEV") exists and is equal to the
logical name of the Jukebox Device. This cross-reference allows quick
determination of the device.  If it does not exist there is no Jukebox Device
present.

(2006.1,2.04) TIME LAST LOOKED                    JBX;4
Xref 1:  2006.1^AJGXTIME^MUMPS
Set: S ^MAG(2006.1,"AJBXTIME")=X
Kill: K ^MAG(2006.1,"AJBXTIME")
Com: TIME LAST LOOKED AT CURRENT PLATTER
```

```
Desc: By accessing this node, ^MAG(2006.1,"AJBXTIME")=X, where X equals the
date/time when the system last looked at the current platter.  The software
is able to calculate the amount of room left on the current platter.

(2006.1,6) TRACK ABSTRACT ACCESSES                1;3
Xref 1:  2006.1^ATRABS^MUMPS
Set: S ^MAG(2006.1,"ATRABS")=X
Kill: K ^MAG(2006.1,"ATRABS")
Com: USE ABSTRACT ACCESS FOR FILE MIGRATION
Desc: This cross reference ^MAG(2006.1,"ATRABS") is 1 if user accesses to
image abstracts are to be used in calculating the time to archive images.
The cross-reference equals 0 if abstract accesses are not to be used in
calculating the time to archive images.

(2006.1,8) DAYS SINCE LAST ACCESS CUTOFF
Xref 1:  2006.1^AIMDEL^MUMPS
Set:  S ^MAG(2006,1),"AIMDEL")=X
Kill:  K ^MAG(2006,1,"AIMDEL")
DESC: This cross-reference contains the cutoff for file deletion in days
since last image access.

(2006.1,9) PACS ACCESS DAYS DELETE CUTOFF
Xref 1:  2006.1^AIMDELPACS^MUMPS
Set:  S ^MAG(2006.1,"AIMDELPACS")=X
Kill:  K ^MAG(2006.1,"AIMDELPACS")
DESC:  This number represents the cutoff in terms of days since last PACS
image access was used for PACS image deletion from magnetic storage.
```

8.8 Imaging Users - File: 2006.19

```
(2006.19,.02) IMAGE FILE NAMESPACE                0;2
Xref 1:  2006.19^C
Set: S ^MAG(2006.19,"C",$E(X,1,30),DA)=""
Kill: K ^MAG(2006.19,"C",$E(X,1,30),DA)
```

8.9 Network Location - File 2005.2

```
(2005.2,1) PHYSICAL REFERENCE
Xref 1: 2005.2^AC
Set: S ^ MAG(2005.2,"AC",$E(X,1,30),DA)=""
Kill: K ^ MAG(2005.2,"AC",$E(X,1,30),DA)
Desc: This cross-reference allows a network location to be looked up by
physical name.
```

8.10 Imaging User Preference - File 2006.18

```
(2006.18,1)
Xref 1: 2006.18^AC
Set: S ^MAG(2006.18,"AC",$E(X,1,30),DA)=""
Kill: S ^MAG(2006.18,"AC",$E(X,1,30),DA)
```

8.11 Imaging Workstation - File 2006.8

```
(2006.8,6) Room/Imaging Function
Xref 1: 2006.8^AWINDISP
Set: I X S ^MAG(2006.8,”AWINDISP”,$P(^MAG(2006.8,DA,0),U)=””
Kill: K ^MAG(2006.8,”AWINDISP”,$P(^MAG(2006.8,DA,0),U)
Desc: This cross-reference tells the Imaging software whether this particular
workstation will display images under MS Windows.  By accessing the node
^MAG(2006.8, “AWINDISP”,SYSTEM) - if this is defined the system is running
the Windows display software.

(2006.8,8) Vista Board Present
Xref 1: 2006.8^AVISTA
Set: I X S ^MAG(2006.8,”AVISTA”,$P(^MAG(2006.8,DA,0),U)=””
Kill: K ^MAG(2006.8,”AVISTA”,$P(^MAG(2006.8,DA,0),U)
Desc: This field tells the Imaging software whether this particular system
has a Vista board installed.  If the node ^MAG(2006.8,”AVISTA”,SYSTEM) is
defined, where SYSTEM equals the three letter system name, then the system
supports a Vista board.

(2006.8,9) DOME Board Present
Xref 1: 2006.8^ADOME
Set: I X S ^MAG(2006.8,”ADOME”,$P(^(MAG(2006.8,DA,0),U)=””
Kill: K ^MAG(2006.8,”ADOME”,$P(^(MAG(2006.8,DA,0),U)
Desc: This field tells the Imaging software whether there is a Dome board
installed. If the node ^MAG(2006.8,”ADOME”,SYSTEM) is defined, where SYSTEM
is equal to the three letter system name, then a Dome board is present and
supported.

(2006.8,50) WRKS Computer Name
Xref1: 2006.8^C
Set: S ^MAG(2006.8,”C”,$E(X,1,30),DA)=””
Kill: K ^MAG(2006.8,”C”,$E(X,1,30),DA)
Desc: The Network computer name will be used to identify the workstation in
this file as well as the on the Network.

(2006.8,51) WRKS DTTM Capture
Xref1: 2006.8^AC
Set: S ^MAG(2006.8,”AC”,$E(X,1,30),DA)=””
Kill: K ^MAG(2006.8,”AC”,$E(X,1,30),DA)
Desc: The latest date time of this workstations capture exe, Tele19n.exe

(2006.8,52) WRKS DTTM Display
Xref1: 2006.8^AD
Set: S ^MAG(2006.8,”AD”,$E(X,1,30),DA)=””
Kill: K ^MAG(2006.8,”AD”,$E(X,1,30),DA)
Desc: The latest date time of this workstations display exe, IMGVWP10.EXE
```

Chapter 9 Archiving, Purging, and Backup

9.1 Introduction

This chapter explains how to archive and purge Imaging V. 2.0 files and Fileman Imaging V. 2.0 entries.

9.2 Archiving and Purging of Image Files

9.2.1 Automatic Image File Migration

The imaging workstation stores the full-size image file on the server when the image is captured. An abstract may be created by the capture workstation, or by placing an entry in the Abstract queue. An entry is placed in the JUKEBOX queue. The background processor creates the abstract (if necessary) and then copies the images to the jukebox.

After a period of time without being used:

1. First, the full-size image will be deleted from the magnetic file server.

2. Next, the abstract will be deleted. If a subsequent request is made to display the full-size image or the abstract, that file will be copied back to the magnetic file server.

9.2.2 Image File Deletion

All images and abstracts are archived permanently on the jukebox. The magnetic file servers function as a high-speed image file cache. Image accesses are recorded. Images that have not been accessed for a long time are removed from the magnetic file server to make room for new images (The actual number of days for the image retention period is a site parameter). Abstracts are kept on the file server for twice as long as the full-size images. The **MAGBIDEL** routine should be invoked periodically by the IRM staff to remove these old images.

This routine is option 2 on the Background Processor's Menu (D ^MAGBMENU). Since image files will be deleted off the Imaging servers, this option must be executed on the Background Processor. The option may also be executed on a workstation that has MSM and is connected to the Imaging servers with the appropriate file securities.

Example:

```
VAH,BPA> D ^MAGBMENU
VISTA Background Processor Menu
```

```
   1  Start the Background Processor
   2  Remove old image file from the magnetic server
   3  Display all tasks that failed to complete
   4  Requeue all tasks that failed to complete
   5  Purge all completed entries in the queue
   6  Support Telephone Numbers

OPTION:  2
 Ready to remove old image files from servers  y// <RET>
 Delete images that have not been accessed for how many days? 90// <RET>
```

9.2.3 Purging the Background Processor's Queue File

The Image Background Queue file (2006.03) holds all the entries to be processed by the Background Processor. Use option 5 of the Background Processor's Menu (listed above) to purge entries in this file. Every entry purged will be recorded in a file named REQUEUE.LOG on the local PC. Unlike the Image file deletion mentioned above, this option can be executed on the **V*IST*A** (DHCP) servers. However, the routines MAGBMENU and MAGBREQ must reside on the **V*IST*A** servers and, if executed on the **V*IST*A** server, the REQUEUE.LOG file will be written to the user's default VMS directory.

9.2.3.1 Additional Background Processor's Utilities

There are two additional tools to assist in monitoring the queued tasks for the background processor. These options are on the Background Processor Menu (^MAGBMENU). The *Display all tasks that failed to complete* option will display all the tasks that failed. If the MAGBMENU and MAGBREQ routines reside on the **V*IST*A** server, then this option can be executed on the **V*IST*A** server. Otherwise, the option will need to be used on the background processor workstation.

The following is an example:

```
VAH,BPA> D ^MAGBMENU

VISTA Background Processor Menu
   1  Start the Background Processor
   2  Remove old image file from the magnetic server
   3  Display all tasks that failed to complete
   4  Requeue all tasks that failed to complete
   5  Purge all completed entries in the queue
   6  Support Telephone Numbers

OPTION:  3

Ok... Here goes nothing... Please be patient...
```

```
Processing entry 3
Error is:  2 Abstract file \\IMAGE_SERVER\IMAGE\I2049723.ABS is already
present

Error is:  -1 Error in MAGBFDEL: -2 (File not found)

Processing entry 811
Error is:  -1 Error in MAGBFDEL: -3 (Path not found or invalid)
```

The *Requeue all tasks that failed to complete* option will recreate entries in the ^MAGQUEUE global for all the tasks that failed and will remove the old task entries. Every entry requeued will be recorded in a file named REQUEUE.LOG on the local PC. This option can be executed on the **V*IST*A** (DHCP) servers. However, the routines MAGBMENU and MAGBREQ must reside on the **V*IST*A** servers and, if executed on the VISTA server, the REQUEUE.LOG file will be written to the user's default VMS directory.

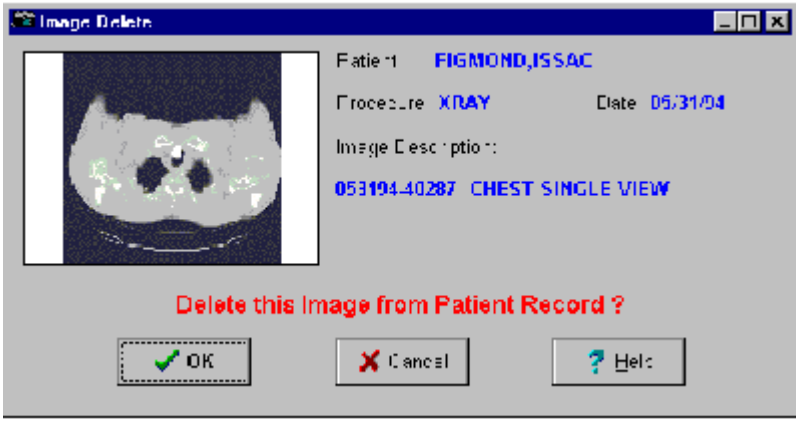
9.2.4 Delete Image and Pointers

Deleting an Image DOS file and its pointer in the ^MAG(2005 global, along with any other pointers to applications (e.g., Laboratory, Medicine, etc.) is available on the Imaging Window Display application. The application will verify that the person has the MAG DELETE security key. Based on the user's security level, this functionality will be visible when an image is displayed. Right-clicking the mouse on an image from the Group Abstract window, or on the Single Abstract window, will display a pop-list with "Delete an Image" as one of the selections. Select and click the "Delete an Image" to flag an image to be deleted.

The following occurs once an image has been flagged for deletion:

- An entry is made in the Background Queue file and will be processed in first-in-first-out basis by the Background processor.
- The Image Audit file (2005.1) will record the information on the deleted image entry.
- An entry will be made in the Image Access Log to indicate that an image was deleted.
- The image entry will be deleted from the Image file (2005) and any pointed to entries will also be updated.
- All DOS files relating to the image will be deleted from the Imaging server(s), but not from the jukebox.

ATTENTION: <u>Caution</u> Must Be Taken when Granting the Image Deletion Key.



9.2.5 Correcting Image Capture Errors

Two (2) types of errors can be made during image capture:

1. An image is captured that the user did not want to save. This type of error is corrected by the image and pointer deletion procedure described above.

2. The user identified the patient incorrectly and therefore saved patient B's images with patient A's text record. Presently, this second type of error must be corrected manually by imaging system manager staff using the following procedure.

9.2.5.1 Delete incorrect image pointers from incorrect patient's record

1. Use the edit option of File Manager to access the image field of the parent package (e.g., radiology, cardiology, laboratory, etc.) for the incorrect patient.

2. Identify and write down the names of the images that were incorrectly placed in this file.

3. Delete these entries.

9.2.5.2 Add correct image pointers to correct patient's record

1. Use the edit option to select the correct patient's report file.

2. Edit the image field and enter the exact same image names that were deleted from the incorrect patient.

9.2.5.3 Verify Correction

Ask the user to examine the image of the correct and incorrect patients, and determine whether the correction was done properly.

9.3 Archiving and Purging of Image FileMan Entries

Entries in the Image file should NOT be purged or archived. The storage space required for these entries is minuscule compared with the space required for the operating system files.

9.4 Backup Information

Sites should establish weekly and daily schedules for backing up images from the Imaging network servers and Jukebox unit(s). A copy of the backed up media should be kept off site. Full backups and incremental backups are recommended. For further information, refer to the "Installing Microsoft SQL Server" section of the Imaging V. 2.0 Installation Manual.

Chapter 10 Callable Routines

10.1 Introduction: RPC Broker Entries and Callable Routines

There are no extrinsic functions or callable routines documented with this version of the **V***IST***A** Imaging software. Any party interested in interfacing with the Imaging software will need to contact the Imaging developers.

10.2 RPC Broker Entry Listing (FileMan)

The following Remote Procedure Calls (RPC) are registered in the REMOTE PROCEDURE file (8994).

MAG ABSJB
MAG CONSULT MSG CREATE
MAG OLU CONSULT
MAGG DTTM
MAGG IMAGE GROUP BIG
MAGG LOGOFF
MAGG MED NEW
MAGG SYS WRKS DISPLAY
MAGG VERIFY ESIG
MAGG WRKS UPDATES
MAGGACTION LOG
MAGGADDIMAGE
MAGGDESCCAT
MAGGDGRPD
MAGGHS
MAGGHSLIST
MAGGIMAGELIST
MAGGLAB FILE
MAGGLAB MICRO
MAGGLAB SECT
MAGGLAB STAIN
MAGGLAB START
MAGGLISTPROC
MAGGLKP
MAGGPATACCESS
MAGGPATADD
MAGGPATAPPT
MAGGPATDUPCHK
MAGGPATINTINF
MAGGPATPROC
MAGGPATSENSITIVE

MAGGPINF1
MAGGPROCIMAGE
MAGGRADIMAGE
MAGGRADLIST
MAGGRADPTR
MAGGRADREPORT
MAGGRPT
MAGGSUR FILE
MAGGSUR GET
MAGGUPREFGET
MAGGUPREFSAVE
MAGGUSER
MAGGUSER2
MAGGUSERKEYS
MAGOGLU
MAGOLUR
MAGPUT
MAGRGETWRITE
MAGRTELW

10.3 Executable Files and DLLs That Interface With Imaging Windows

The Imaging software utilizes DLLs and executable files developed in house and from sources such as scanner, video, and capture-card manufacturers. These files are distributed with the Imaging software. However, some of the files listed may be replaced with newer drivers from manufacturers.

The following files are installed on the C:\VISTA\IMAGING directory.

File Name	Function(s) Performed
ABSTRTGA.EXE	Creates image abstracts
BICLDR.DLL	DELPHI utilities
BICLDR.EXE	DELPHI utilities
BICLGR.EXE	DELPHI utilities
BICWN92.DLL	DELPHI utilities
BICWNADD.DLL	DELPHI utilities

File Name	Function(s) Performed
BIVBX11.DLL	DELPHI utilities
CAPTURE.GID	VISTA capture utilities
DDECLIMG.EXE	Radiology Viewer
FRAMEGRAB.EXE	ATVISTA capture window
HSUMM.TXT	Health summary text for Demo software.
IMGVW.GID	VISTA display utilities
IMGVWP10.EXE	VISTA display program
KF911.DLL	Document Display Utilities
KFDLG.DLL	Document Display Utilities
KIPP.DLL	Document display utilities
KIPPCALS.FLT	Document display utilities
KIPPEMS.FLT	Document display utilities
KIPPPCX.FLT	Document display utilities
KOFAX.CPL	Document display utilities
KOFAX.INI	Document display utilities
KOFAX.LOG	Document display utilities
KVIEW.VBX	Document display utilities
LOGFILE.TXT	Log file on all current updates for VISTA Imaging software
LSDT.IMG	
MAGGD2.EXE	Demo program.
MAGSYS.EXE	MAG.INI editor

File Name	Function(s) Performed
MAGSYS.GID	MAG.INI utility
METEORC5.EXE	Meteor capture window
SCAN108N.BAT	Scanning utilities
SCAN112N.BAT	Scanning utilities
SCAN75N.BAT	Scanning utilities
SCANFILM.EXE	Scanning utilities
SCANI50N.BAT	Scanning utilities
SCANTGA.EXE	Scanning utilities
SCNAPI.DLL	Scanning utilities
SCONN16.DL	Security functions
STGFLT.DLL	Scanning utilities
SWCEP.DLL	
SWENG.DLL	
SWENGPT.CHW	
TELE19N.EXE	VISTA capture program
TESTC3.EXE	ATVISTA capture card utilities
TESTW.EXE	ATVISTA capture card utilities
VBUDLL.DLL	
VISTA.TXT	Documentation on ATVISTA capture board

The following files are installed in the C:\WINDOWS\SYSTEM directory for Windows 95 or C:\WINNT35\SYSTEMS32 directory for Windows NT workstations.

File Name	Function(s) Performed
VBOX.VBX	Radiology viewer utilities
ACCUVBV5.DLL	AccuSoft utilities
BIVBX11.DLL	Delphi utilities
CMDIALOG.VBX	Document scanning utilities
ACCUV532.VBX	AccuSoft utilities
VBRUN300.DLL	Radiology viewer utilities
VLINK.DLL	Radiology viewer utilities
VPIXEL.DLL	Radiology viewer utilities
VSVBX.VBX	Radiology viewer utilities
MEMSTRP5.DLL	Rotates Radiology image
SCONN16.DLL	Security functions
_ISREG32.DLL	

The following files are installed in the C:\WINDOWS directory for Windows 95 or C:\WINNT35 directory for Windows NT.

File Name	Function(s) Performed
KOFAX.INI	Document utilities INI file
IMAGING.HLP	Imaging User manual

The following files are installed in the C:\WINDOWS\VLMOD directory for Windows 95 or C:\WINNT35\VLMOD directory for Windows NT.

File Name	Function(s) Performed
MVVIEW.VLM	Radiology viewer utilities
GIF.VLM	Radiology viewer utilities
BMP.VLM	Radiology viewer utilities
PCX.VLM	Radiology viewer utilities
RAW.VLM	Radiology viewer utilities
TIFF.VLM	Radiology viewer utilities
TWAIN.VLM	Radiology viewer utilities

The following files are installed in the C:\VISTA\IMAGING\BMP directory.

File Name	Function(s) Performed
ABSJBOX.BMP	Jukebox bitmap
ABSEKG.BMP	EKG bitmap
ABSERROR.BMP	Error connecting bitmap
ABSCINE.BMP	Cine-loop Abstract bitmap
ABSPACG.BMP	PACS group bitmap
ABSPACI.BMP	PACS abstract bitmap

10.4 Error Messages

Users may encounter several types of errors as they use Imaging V. 2.0. Some of these errors are

- **Processing errors**: which means that Imaging V. 2.0 failed to complete a processing task.
- **Data errors:** which means that Imaging V. 2.0 attempted to use data that was incomplete or formatted incorrectly.
- **Command errors:** which means that users and other programs that interact with Imaging V. 2.0 issued commands that conflicted with other commands or with Imaging V. 2.0's processing state.

The table below lists many of the error messages that Imaging V. 2.0 users may encounter, a description of each message, and causes or solutions.

Error message	Cause(s)/Solutions
Can't open device WORKSTATION BROKER.	The entry "WORKSTATION BROKER" has not been defined in the Device file. Please review the Kernel Broker installation notes.
You don't have the proper Security Keys to capture LAB images.	The USE CAPTURE KEY field in the Imaging Site Parameter file (2006.1) has been turned on and the user has not been assigned the proper key. Please review the Security Key section.
Error in connecting to Server \\ servername\image\	Possible cause are: 1. The workstation has not been setup properly. 2. The IMAGEUSER profile, or the profile currently logged-on, has not been given the proper security level. 3. The server listed is down. Check with the network administrator regarding the server status and the workstation's profile.
AutoUpdating is disabled. Network Configuration file	The MAGNET.INI file is not on the Network Update directory.

Error message	Cause(s)/Solutions
doesn't exist.	1. Contact network administrator and request that a copy of the MAGNET.INI file be placed in the Network Update directory. 2. A copy of this file can be obtained from the Imaging developer's anonymous directory. FTP to 152.128.2.49. 3. Review Imaging Installation manual.
AutoUpdating disabled. The network update Directory doesn't exist.	Cannot connect to the directory or it does not exist. 1. User does not have privileges to the distribution directory. 2. Workstation log-on profile does not connect to Network Update directory. 3. Contact network administrator.
AutoUpdating disabled. Workstation isn't configured for Auto Updating	No update directory in the MAG.INI file under section SYS_AUTOUPDATE for variable DIRECTORY. 1. Run MAGASET.EXE from the Network Update directory. This will automatically define the DIRECTORY entry in the MAG.INI file for the current workstation.
AutoUpdating is disabled. No ComputerName is defined.	No computer name in the MAG.INI file under section SYS_AUTOUPDATE for variable ComputerName. 1. On Window 3.1, edit the MAG.INI file and type (under the SYS_AUTOUPDATE section): ComputerName=your computer name (Use the computer name defined in the Control Panel section.) 2. On Windows 95 or Windows NT, the computer name should have been defined under the Control Panel. Review the computer Identification tab entry.
AutoUpdating canceled.	The MAGSETUP.EXE file does not reside in the

Error message	Cause(s)/Solutions
No Updates available.	Network Update directory. 1. Contact the network administrator and request a copy of the MAGSETUP.EXE file be placed on the Network Update directory. 2. Instructions about obtaining a copy of this file are available at http://vaww.va.gov/vhacio/imaging.

The following errors are possible during the MAGSETUP.EXE file execution. When the MAGSETUP file is transported via FTP, it should be in binary format (or possible file corruption may occur).

Error Message	Cause	Solution
Auto Updating canceled	System out of memory	The local workstation needs more memory. 1. Review the installation manual regarding the memory requirements. 2. Review the applications installed on the workstation.
	File not found	Possible corrupted MAGSETUP.EXE file.
	Path not found	Possible corrupted MAGSETUP.EXE file.
	Attempt was made to dynamically link to a task.	Possible sharing or network-protection error.
	Insufficient memory to start the application.	The local workstation needs more memory. 1. Review the installation manual regarding the memory requirements. 2. Review the applications installed on the workstation.

Error Message	Cause	Solution
	Incorrect Windows version.	Review the installation manual regarding the application's Windows compatibility.
	Invalid executable file.	Possible error in .EXE file or not a Windows application.
	Application was designed for a different operating system.	Review the installation manual regarding PC's operating system requirements.
	Application was designed for MS-DOS 4.0.	Review the installation manual regarding PC's DOS requirements.
	Type of executable file was unknown.	Possible corrupted MAGSETUP.EXE file.
	Attempt was made to load a real-mode application.	Review the installation manual regarding application's Windows compatibility (MAGSETUP.EXE may be written for an earlier version of windows. If so, obtain latest MAGSETUP.EXE file.).
	Attempt was made to load a second instance of an executable file containing multiple data segments that were not marked for read-only.	Possible corrupted MAGSETUP.EXE file.
	Dynamic Link Library (DLL) file was invalid.	One of the DLLs required to run this application was corrupt.
	Application requires Windows 32-bit extension.	Review the installation manual regarding the application's Windows requirements.

10.5 Test Software Available for Troubleshooting

10.5.1 Introduction

When setting up a workstation, it is often necessary to use software to test isolated workstation functions. A number of executables are available for:

- network connectivity
- connectivity to the Kernel Broker
- ability to display images
- connectivity to image servers and capture servers
- display or network timing tests

These executables are described in the following sections.

10.5.2 PING, TRACERT

The PING and TRACERT commands are available in the DOS directory on a workstation. Using these commands can help determine if the IP address supplied in the HOST or LMHOST file is reachable, or if a possible Routing problem exists. The local PC support person in IRM can assist with the usage of these commands and the local network IP addressing scheme.

10.5.3 EGCHO.EXE

The EGCHO.EXE file is located in the VISTA\BROKER directory. This file can be used to test the Broker Client Manager connection to the **V*IST*A** servers. Once this file is executed, the **V*IST*A** Access/Verify Code Window should display. If it does not, one or a combination of the following could be happening:

- The TCP Listener is not running on the Vista servers
- An invalid IP address or listening port number was configured during the Broker Client Manager software installation on the workstation.

  Note: Please review the Kernel Broker documentation on the usage of this executable file and installation of the Broker Client Manager software.

10.5.4 VIEWER

The RADVIEW.EXE tool allows viewing black and white TGA file formats, and is located in the VISTA\IMAGING\TOOLS directory. This tool can be used without executing the Imaging software or needing to log-in to the **V*IST*A** servers. It is used primarily to test...

- the display utilities used within the Imaging software
- network connectivity and performance
- image file formats
- the local PC's available RAM

This executable allows selecting images from the local PC or across the network drives, depending on the user's network security level. The Image file, #2005, has the file reference as well as the magnetic storage information for the image that should help determine the full path directory needed by this tool.

To execute this tool, use the Windows Explorer and double click on the RADVIEW.EXE file **(Note: This tool should only be available to system managers)**.

Enter a file path after clicking on the File option from the top menu bar (see Figure 10.5.4a) and select the Open Image option. A second window will appear to allow entering the file path and name (see Figure 10.5.4b). The image should now display in the **BLACKENED** portion of the **V*IST*A** Radiology Display window and all image manipulation available on this window can be tested.

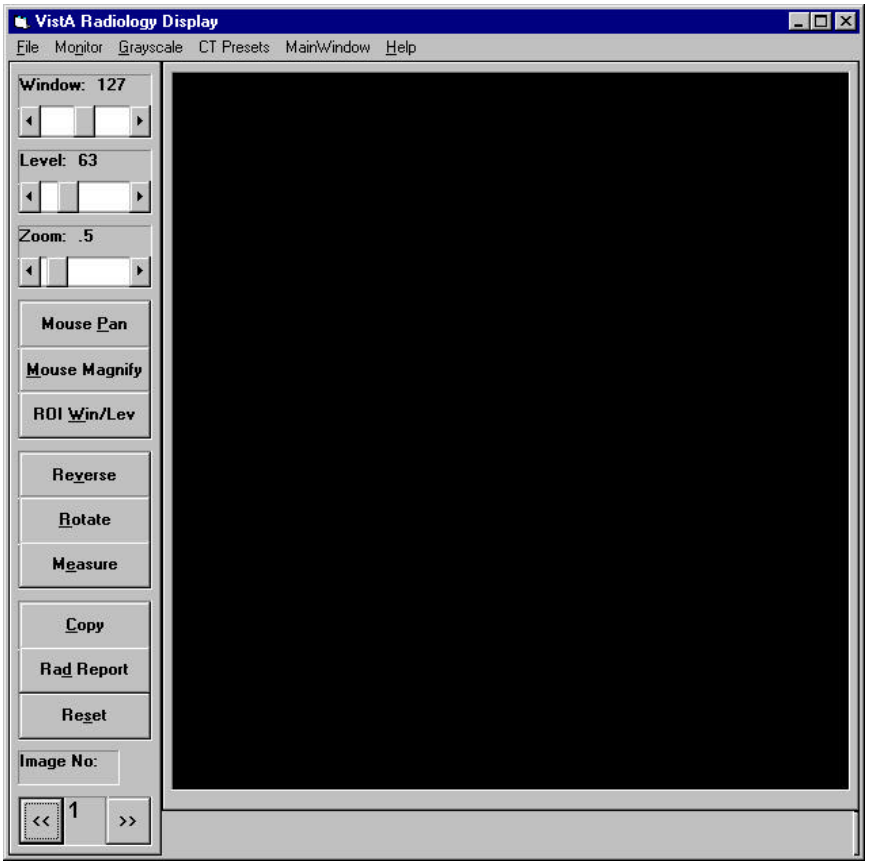


Figure 10.5.4a Radiology Viewer

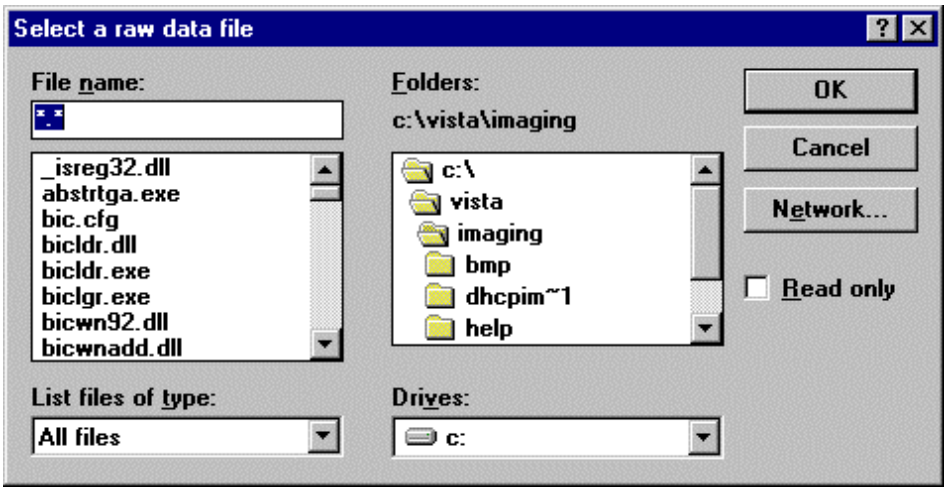


Figure 10.5.4b -Radiology View Tool option to select an image file

10.5.5 IMGVWP1O, Demo Mode

The Imaging Display software has a DEMO mode that allows the software to be tested without connecting to the **V*IST*A** servers. This mode can be used to test the workstation's video display settings (i.e., color palette, pixels, fonts, and desktop settings). It also can be used to be sure all Imaging files were installed correctly.

10.5.6 TELE19P, Test Mode

The Imaging Capture software has a Test mode that allows testing of input devices (scanners, video capture boards, etc.). The Test mode also features:

- Testing of the capture functions without a connection to the VISTA servers
- No requirement to identify patients

In addition, the image test file will not be saved. This mode is helpful when interfacing and testing new equipment.

10.5.7 Timing Test

The Timing test tool is available on the Viewer (RADVIEW.EXE) tool and can be used to test the speed of a workstation. The test tool will run through variations of tests (i.e., window /leveling, zooming, and various panning of the image). Follow the same instructions outlined in section 10.5.4 VIEWER to execute the RADVIEW.EXE file and select the sub-option Timing Test from the FILE top menu bar on the Vista Radiology Display window (see figure 10.5.4a). A report on the speed and elapsed time of the test will be displayed at the bottom of the window.

Chapter 11 External Relations

11.1 Orientation

The **V***IST***A** Imaging System package integrates with a number of other **V***IST***A** packages using five (5) general mechanisms for integration:

- Pointers to the 2005 file located in Medicine, Laboratory, Surgery, and Radiology packages.
- Parent file information is stored in the Image file.
- Images collected using all packages are displayed in the **V***IST***A** Imaging Display Window.
- GUI display allows user selection of procedures from other packages.
- GUI display shows reports from other packages.

Integration agreements have been signed with the Medicine, Laboratory, Surgery, Radiology/Nuclear, Health Summary, Engineering, and Registration packages.

11.2 DBI Custodial Agreements

```
745     NAME: DBIA253-C
CUSTODIAL PACKAGE: HEALTH SUMMARY               Salt Lake City
SUBSCRIBING PACKAGE: AUTOMATED INFO COL           Albany
                     IMAGING                      Washington
USAGE: Controlled Subscri APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
DESCRIPTION:                          TYPE: Routine
Integrated Billing has permission from Health Summary to make the following
calls:
1) If ENX^GMTSDVR does not exist (version 2.5 or latter not installed),
permission to print Health Summaries by: b) Calling SELTYP1^GMTS and then
EN^GMTS1 to print the Health Summary.
ROUTINE: GMTS
COMPONENT:  SELTYP1
VARIABLES:
                         *************************
746     NAME: DBIA253-D
CUSTODIAL PACKAGE: HEALTH SUMMARY               Salt Lake City
SUBSCRIBING PACKAGE: AUTOMATED INFO COL           Albany
                       IMAGING                       Washington
USAGE: Controlled Subscri APPROVED: APPROVED
STATUS: Active              EXPIRES:
```

```
DURATION: Till Otherwise Agr  VERSION:
DESCRIPTION:                          TYPE: Routine
Integrated Billing has permission from Health Summary to make the following
calls:1) If ENX^GMTSDVR does not exist (version 2.5 or latter not installed),
permission to print Health Summaries by: A) Calling SELTYP1^GMTS and then
EN^GMTS1 to print the Health Summary.
ROUTINE: GMTS1
COMPONENT:  EN
VARIABLES:
```

11.3 DBI Subscriber Agreements

```
**IMAGING Integration Agreements subscribed to

1171     NAME: DBIA1171
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 74                     ROOT: RARPT
DESCRIPTION:                          TYPE: File
The Radiology Package will reserve field 2005 of file #74 to be used as a
multiple for pointers to file #2005.  This field will first be supported in
Radiology/Nuclear Medicine Version 4.5.  Imaging will write pointers to field
2005 of file #74
            ^RARPT(D0,2005
             2005     IMAGE    2005;0   Direct Global Read
This field contains a pointer to File 2005 (IMAGE).
                          ********************
1172     NAME: DBIA1172
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED:
STATUS: Pending             EXPIRES:
DURATION:                     VERSION:
FILE: 70                     ROOT:
DESCRIPTION:                          TYPE: File
Radiology gives permission to Imaging to read file #70 (^RADPT).
                          ********************
1174     NAME: DBIA1174
  CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED:
STATUS: Pending             EXPIRES:
DURATION:                     VERSION:
FILE: 71                     ROOT:
DESCRIPTION:                          TYPE: File
Radiology gives permission to Imaging to read file #71 (^RAMIS).
                          ********************
1175     NAME: DBIA1175
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
```

```
USAGE: Private            APPROVED:
STATUS: Pending             EXPIRES:
DURATION:                     VERSION:
FILE: 72                    ROOT:
DESCRIPTION:                        TYPE: File
Radiology gives permission to Imaging to read file #72 (^RA).
                          ********************
1176     NAME: DBIA1176
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR           Chicago
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Retired             EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 74                    ROOT: RARPT(
DESCRIPTION:                        TYPE: File
Radiology gives permission to Imaging to read file #74 (^RARPT).
     ^RARPT(D0,2005
       2005     IMAGE                2005;0   Direct Global Read
                          ********************
1177     NAME: DBIA1177
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR           Chicago
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                       ROOT:
DESCRIPTION:                        TYPE: Routine
Radiology gives permission to Imaging to call ^RARTR to display a radiology
report.  This will be called with RARPT set to the internal entry number for
the report to be displayed.
ROUTINE: RARTR
                          ********************
1178     NAME: DBIA1178
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR           Chicago
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                       ROOT:
DESCRIPTION:                        TYPE: Routine
Radiology gives permission to Imaging to call CREATE^RARIC to write data to
the ^RARPT global.  This will be called after RA variables are set as done by
RAPTLU (for example, RADTE, RACN, RADFN, RADTI, RACNI, etc).

A report created through this call by the Imaging Package is a skeletal
report that is there solely for the purpose of providing a place to store the
Imaging pointer in Field 2005.  This is necessary because images are very
often captured prior to the report transcription
ROUTINE: RARIC
COMPONENT:  CREATE
VARIABLES:  RADTE  Input (Date/Time of Radiology Exam (external format)
            RADFN  Input (Patient's DFN)
            RADTI  Input (Radiology Case Date/Time (internal  format, reverse
chronological)
            RACN   Input (Case Number, external format)
            RACNI  Input (Radiology Case Number, internal pointer to ^RADPT)
                          ********************
```

```
1179     NAME: DBIA1179
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                        ROOT:
DESCRIPTION:                        TYPE: Routine
Radiology gives permission to Imaging to call PTR^RARIC to write data to the
^RARPT global.  This is called with RARPT set to the internal entry number of
the radiology report file and MAGGP set to the internal entry number for the
image/object in File 2005.  MAGGP will be set into file 74 as the pointer to
the image/object
ROUTINE: RARIC
COMPONENT:  PTR
VARIABLES:  RARPT  Input (Internal entry number of radiology report file to
receive IMAGE pointer)
            MAGGP  Input (Internal entry number in File 2005 to be pointed to
by report in File 74)
                           ********************
1180     NAME: DBIA1180
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED:
STATUS: Pending             EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                        ROOT:
DESCRIPTION:                        TYPE: Routine
Radiology gives permission to Imaging to call UP1^RAUTL1 to write data to the
^RADPT global.
ROUTINE: RAUTL1
COMPONENT:  UP1
VARIABLES:  RADFN       Input
                      Patient's internal entry number (DFN)
            RADTI       Input
                      Internal reverse exam date/time
            RACNI       Input
                      Internal case number ien
                            ********************
1189     NAME: DBIA1189-A
CUSTODIAL PACKAGE: MEDICINE                     Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                        ROOT:
DESCRIPTION:                        TYPE: File
The purpose of this agreement is to provide access to the Medicine package
(custodian) by the Imaging package (subscriber) for the purpose of creating a
new Medicine package entry (stub:Pt ID, Date/time) as a holder of an Imaging
pointer or set of Imaging pointers.  The Imaging pointers are set in the
field 2005, as descendants of the 0 subscript of node 2005 in each of the
following files: Echo(691), Cardiac Cath(691.1), EKG(691.5), Hematology(694),
Endoscopy(699), Generalized Procedure(699.5), and Rheumatology(701)
The Imaging routines that perform this function are as follows: MAGMCPT and
MAGUFILR
                           ********************
```

```
1190     NAME: DBIA1189-B
CUSTODIAL PACKAGE: MEDICINE                    Washington
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                       ROOT:
DESCRIPTION:                       TYPE: File
The purpose of this agreement is to provide access to the Medicine package
(custodian) by the Imaging package (subscriber) for the purpose of editing
(including deletion of) Medicine package Image entries.  The Imaging pointers
are set in the field 2005, as descendants of the 0 subscript of node 2005 on
each of the following files: Echo(691), Cardiac Cath(691.1), EKG(691.5),
Hematology(694), Endoscopy(699), Generalized Procedure(699.5), and
Rheumatology(701.

The Imaging routines that perform this function are as follows: MAGMCPT*,
MAGUDEL* and MAGUFILR
                          ********************
1191     NAME: DBIA1189-C
CUSTODIAL PACKAGE: MEDICINE                    Washington
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                       ROOT:
DESCRIPTION:                       TYPE: File
The purpose of this agreement is to provide access to the Medicine package
(custodian) by the Imaging package (subscriber) for the purpose of displaying
Medicine package Summary fields associated with Images.
The Imaging functions require direct global read access to the
Procedure/Subspecialty file (697.2), the Image multiple of each of the
Medicine Procedure files listed below, and the Summary field each of the
Files Listed below.

Medicine Procedure Files: Echo(691), Cardiac Cath(691.1), EKG(691.5),
Hematology(694), Endoscopy(699), Generalized Procedure(699.5), and
Rheumatology(701). The Imaging routines that perform this function are as
follows: MAGDISP, MAGMIM, MAGSUM, and MAGABLP
                          ********************
1193     NAME: DBIA1193
CUSTODIAL PACKAGE: MEDICINE                    Washington
SUBSCRIBING PACKAGE: IMAGING                     Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                       ROOT:
DESCRIPTION:                       TYPE: Routine
This privately supported entry point allows the display the full Medicine
report associated with the Imaging Workstation Display. The routine MCMAGDSP
has an entry point of REPRT which, when passed the IEN and the  Medicine
package file number, will display the full report to the Workstation (only).
This routine (MCMAGDSP) will be bundled in a patch to Medicine 2.2.  It
contains display functionality for the following types of Medicine
procedures: Electrocardiograms (ECG), Echocardiography (ECHO), Cardiac
Catheterization, Hematology (Bone Marrow biopsies and aspirates), Pulmonary
Endoscopies, Gastrointestinal Endoscopies, Medicine Consults, Generic
```

Procedures, and Rheumatology. This is the current extent of Medicine procedures that have Imaging pointer fields. This reporting functionality uses the Procedure/Subspecialty file in tandem with the result files to determine the type of procedure. This is necessary as many of the results files share a common structure to house data of different procedure types (as in different CPTs). The MCMAGDSP routine uses the same compiled print templates that Medicine uses and there are also calls to utilities of the common Medicine print driver.
ROUTINE: MCMAGDSP
COMPONENT: REPRT
VARIABLES: MC_IEN Input (This is the internal entry number of the Medicine procedure being displayed. This variable is passed by value in the first position of the parameter list).
MC_FILE Input (This variable is the Medicine package Fileman file number which contains the procedure data to be displayed. This variable is passed by value in the second position of the parameter list.)

****

1203 NAME: SURGERY/IMAGING REPORT DISPLAY
CUSTODIAL PACKAGE: SURGERY Birmingham
SUBSCRIBING PACKAGE: IMAGING Washington
USAGE: Private APPROVED: APPROVED
STATUS: Active EXPIRES:
DURATION: Till Otherwise Agr VERSION:
FILE: ROOT:
DESCRIPTION: TYPE: Routine
The Imaging Package is given permission to call SROPRPT to display surgery operation reports.
ROUTINE: SROPRPT
COMPONENT: SROPRPT
VARIABLES: SRTN Input (The variable SRTN (which identifies the surgical case) may be defined before making the call. If the variable SRTN is not defined when the call is made, the user will be prompted to select a patient and operation.)

****

1204 NAME: SURGERY/IMAGING FIELD 2005
CUSTODIAL PACKAGE: 213 Birmingham
SUBSCRIBING PACKAGE: IMAGING Washington
USAGE: Private APPROVED: APPROVED
STATUS: Active EXPIRES:
DURATION: Till Otherwise Agr VERSION:
FILE: 130 ROOT: SRF(
DESCRIPTION: TYPE: File
The Surgery Package will reserve field 2005 of File 130 for an IMAGE multiple pointing to File 2005. (The Surgery Package will be adding this field to its package as soon as feasible.) Imaging Package is given permission to set and delete pointers from Field 2005 of File 130.
^SRF(D0,2005
2005 IMAGE 2005;0 Direct Global R/W
This field contains pointer(s) to entries in the IMAGE File 2005 indicating image(s) associated with this operation procedure report. Surgery Operation Report file.

****

1208 NAME: DBIA1208
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR Chicago
SUBSCRIBING PACKAGE: IMAGING Washington
USAGE: Private APPROVED: APPROVED
STATUS: Active EXPIRES:

```
DURATION: Till Otherwise Agr  VERSION:
FILE:                         ROOT:
DESCRIPTION:                          TYPE: Routine
Radiology gives permission to Imaging to call SET^RAPSET1.  The purpose of
this call is to set up some variables needed to do exam look-ups, etc.
ROUTINE: RAPSET1
COMPONENT:  SET
VARIABLES:
                              ********************
1209     NAME: DBIA1209
CUSTODIAL PACKAGE: RADIOLOGY/NUCLEAR            Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION:                     VERSION:
FILE:                         ROOT:
DESCRIPTION:                          TYPE: Routine
Radiology gives permission to Imaging to call ^RACNLU look up a patient by
radiology case number.  SET^RAPSET1 must be called first to set variables.
This is an interactive routine, so the user provides other input.
ROUTINE: RACNLU
                              ********************
1218     NAME: ENGINEERING/IMAGING
CUSTODIAL PACKAGE: ENGINEERING                  Washington
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 6914                    ROOT: ENG(6914
DESCRIPTION:                          TYPE: File
Imaging Package is given permission to point to File 6914. ^ENG(6914,D0,0)
   .01      ENTRY   0;1      Read w/Fileman   Equipment item sequential
number from Inventory File.
                              ********************
1219     NAME: ENNGINEERING/IMAGING SPACE
CUSTODIAL PACKAGE: ENGINEERING                  Washington
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 6928                    ROOT: ENG(6928
DESCRIPTION:                          TYPE: File
The Imaging Package is given permission to point to File 6928.
^ENG(6928,D0,0)
    .01      ROOM NUMBER          0;1      Read w/Fileman
Room number in medical center Engineering space file contains detailed
information about each room in the Medical Center.
                              ********************
1915     NAME: DBIA1915
CUSTODIAL PACKAGE: LAB SERVICE                  Dallas
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED:
STATUS: Pending             EXPIRES:
DURATION:                     VERSION:
FILE: 63                      ROOT: LR(
DESCRIPTION:                          TYPE: File
    ^LR(    2005     IMAGE                2005,0   Read w/Fileman
```

```
                          ********************
1958     NAME: DBIA1958
CUSTODIAL PACKAGE: LAB SERVICE                  Salt Lake City
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Supported          APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE:                        ROOT:
DESCRIPTION:                          TYPE: Routine
This API will get Lab results for a given patient based on various input
parameters.
ROUTINE: LR70SUM
   COMPONENT:  EN(Y,DFN,SDATE,EDATE,COUNT,GIOM,SUBHEAD)
   VARIABLES:  Y           Output    Tells the calling routine where the data
is stored.
        DFN           Input    Internal number of the patient as stored in
^DPT(DFN
        SDATE      Input    Start date to search for results (optional)
        EDATE      Input    EDATE=End date to search for results (optional)
        COUNT     Input    COUNT=Count of results to send (optional)
        GIOM        Input    GIOM=Right margin - default 80 (optional)
        SUBHEAD   Input  SUBHEAD=Array of subheaders from file 64.5, misc,
micro & AP to show results. (Null param = get all results)
This is a 'silent' call.  No prompts are given.  The results are formatted
and stored in the global: ^TMP("LRC",$J) "CH" type results are stored in the
pre-defined cumulative format.  Headers for each format are stored in:
^TMP("LRH",$J,NAME)=line # An index of where tests can be found in a report
are found in: ^TMP("LRT",$J,print name)=header^line # of 1st occurrence  Test
entries without a header means that the test is defined in the report, but
there are no results.
COMPONENT:  GET64(Y)
VARIABLES:  Y           Output
This is the name of the array that the report headers are returned in. This
entry point will get a list, in Y(name) of all the minor headers from the Lab
Reports file.  It also includes in the Y array the names of other report
headers not included in the Lab Reports file such as:
                          S Y("MISCELLANEOUS TESTS")=""
                          S Y("MICROBIOLOGY")=""
                          S Y("BLOOD BANK")=""
                          S Y("CYTOPATHOLOGY")=""
                          S Y("SURGICAL PATHOLOGY")=""
                          S Y("EM")=""
This call is intended to be used with EN^LR7OSUM when it is necessary to pre-
select a specific area within Lab for retrieving results.
                          ********************
1959     NAME: DBIA1959
CUSTODIAL PACKAGE: LAB SERVICE
SUBSCRIBING PACKAGE: IMAGING                        Washington
  Images captured under the Autopsy specialty are saved with references to
the Autopsy accession number and pointers to the Image subfields in the Lab
Data file, 63.  These references will be used to pass the patient dfn and
autopsy accession number when the routine LRAURPT is called.  Imaging
routine, MAGGTRPT, does verify that the Autopsy reports has been release
prior to executing the LRAURPT routine.
USAGE: Controlled Subscri APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
```

```
FILE:                          ROOT:
DESCRIPTION:                          TYPE: Routine
This agreement is to use routine LRAURPT to produce an autopsy report for
images captured under the Autopsy Lab specialty. At the present time, there
is no supported API for this functionality.
ROUTINE: LRAURPT
COMPONENT:  QUE
VARIABLES:  LRQ(8)    Input    Variable defining the accession prefix.
            LRAP       Input     Set to LRDFN
            LRDFN    Input     Patient's DFN in the Lab Data file, 63.
            LRD         Input      Set to 1 for printing weights, measures
and coding (if present).
            LRSAV    Input     Set to null - not to Save protocol list for
reprinting.
            LRAN      Input      Accession number
            LRAA      Input      Autopsy IEN
            LRSS        Input     AP Section.
This routine will printout a formatted autopsy report.
                          ********************
1962     NAME: DBIA1962
CUSTODIAL PACKAGE: LAB SERVICE
SUBSCRIBING PACKAGE: IMAGING                          Washington
  This request is needed for referencing/reading Lab Data global nodes. To be
used for verification of Image pointers, set during image capture, and for
report display.
USAGE: Controlled Subscri APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 63                      ROOT: LR(DO,0
DESCRIPTION:                          TYPE: File
This request is for referencing/reading the Laboratory Data file 63. Imaging
saves Image pointers in the following sub-field of the Lab Data file: For
Autopsy Images:
       Lab Data sub-file:
       DD(63.2,0) = AUTOPSY ORGAN/TISSUE SUB-FIELD^NL^2005.1^9
            sub-fields:
       DD(63.2,2005,0) = IMAGE (GROSS)^63.28P^^2005;0
       DD(63.2,2005.1,0) = IMAGE (MICROSCOPIC)^63.45P^^2005.1;0
For Surgical Pathology Images:
       Lab Data sub-file:
       DD(63.08,0) = SURGICAL PATHOLOGY SUB-FIELD^NL^2005^38
            Sub-field:
       DD(63.08,2005,0) = IMAGE^63.82005P^^2005;0
For Cytology Images:
       Lab Data sub-file:
       DD(63.09,0) = CYTOPATHOLOGY SUB-FIELD^NL^2005^34
            Sub-field:
       DD(63.09,2005,0) = IMAGE^63.92005P^^2005;0
For Electron Microcopy:
       DD(63.02,0) = EM SUB-FIELD^NL^2005^32
            Sub-field:
       DD(63.02,2005,0) = IMAGE^63.22005P^^2005;0
Reading of this file is required to verify the Lab file's references, saved
during image capture, needed for displaying lab reports.
     ^LR(DO,'AU')
       14.7     AUTOPSY RELEASE DATE AU;15    Direct Global Read   Autopsy
release date/time
```

```
       14       AUTOPSY  ACC #       AU;6     Direct Global Read   Autopsy
accession number
       13.5     RESIDENT PATHOLOGIST 0;7      Direct Global Read    RESIDENT
PATHOLOGIST
       11       AUTOPSY DATE/TIME    0;1      Direct Global Read    AUTOPSY
DATE/TIME
Autopsy node.
  ^LR('AAUA', Cross-reference for Autopsy by year, accession area
abbreviation, accession number, lrdfn.
  ^LR('ASPA', Cross-reference for Surgical pathology, accession area
abbreviation, accession number, lrdfn.
  ^LR('ACYA' Cross-reference for Cytology.
  ^LR('ACYA',YEAR,ACCESSION AREA ABBREVIATION,ACCESSION NUMBER, LRDFN
  ^LR('AEMA', Cross-reference for Electron Microscopy
  ^LR('AEMA',YEAR,ACCESSION AREA ABBREVIATION, ACCESSION NUMBER,LRDFN
  ^LR(D0,0)   .02      PARENT FILE         0;2  Direct Global Read  (Pointer
to file of file - Patient file or Referral file.)
                     .03      NAME         0;3      Direct Global Read
Patient name.
 Root node of file 63
^LR(DO,'SP',D1,0)
  .01      DATE/TIME SPECIMEN T 0;1      Direct Global Read   Date & time
specimen taken.
  .02      PATHOLOGIST          0;2      Direct Global Read     Pathologist
  .06      SURGICAL PATH ACC #  0;6      Direct Global Read   Surgical
Pathology accession number.
^LR(D0,'SP',D1,.1,D2,0)
  .01      SPECIMEN             0;1      Direct Global Read        Specimen
^LR(DO,'AY',D1,0)
  .01      AUTOPSY ORGAN/TISSUE 0;1      Direct Global Read    AUTOPSY
ORGAN/TISSUE - Specimen
        AUTOPSY ORGAN/TISSUE subfile.
^LR(DO,'CY',D1,0)
  .01       DATE/TIME SPECIMEN  0;1      Direct Global Read    DATE/TIME
SPECIMEN TAKEN
  .02       PATHOLOGIST         0;2      Direct Global Read      PATHOLOGIST
  .06       CYTOPATH ACC #      0;6      Direct Global Read         CYTOPATH
ACCESSION NUMBER.
^LR(DO,'CY',D1,.1,D2,0)
  .01      SPECIMEN             0;1      Direct Global Read
SPECIMEN
^LR(DO,'EM',D1,0)
  .01      DATE/TIME SPECIMEN T 0;1      Direct Global Read  DATE/TIME
SPECIMEN TAKEN
  .02      PATHOLOGIST          0;2      Direct Global Read  PATHOLOGIST
  .06      EM ACC #             0;6      Direct Global Read   EM ACCESSION
NUMBER
^LR(DO,'EM',D1,.1,D2,0)
  .01      SPECIMEN             0;1      Direct Global Read  Specimen.
        Electron Microscopy sub file.
                           ********************
1963     NAME: DBIA1963
CUSTODIAL PACKAGE: LAB SERVICE
SUBSCRIBING PACKAGE: IMAGING                        Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
```

```
FILE: 68                    ROOT: LRO(68
DESCRIPTION:                       TYPE: File
The purpose of this request is to provide the Imaging package access to read
the Laboratory Accession file for image capture.  Image capture for Radiology
will require the person to provide an Accession area, Accession year and
Accession number.  These entries are used to verify the existence of the Lab
entry and to display a list of specimens for the accession number provided.
 ^LRO(68,DO,0)
       .01       AREA               0;1      Direct Global Read
ACCESSION AREA
       .09       ABBREVIATION       0;11     Direct Global Read   ACCESSION
AREA ABBREVIATION
       .02       LR SUBSCRIPT       0;2      Direct Global Read   The
subscript where the data is stored..."SP","CY",etc.
                          ********************
1999     NAME: DBIA1999
CUSTODIAL PACKAGE: MEDICINE                     Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
FILE: 690                   ROOT: MCAR(690,
DESCRIPTION:                       TYPE: File
By providing read access to file 690, the Medical Patient file, offer the
user a list of existing medicine procedures to append Images to.
For a list of patient procedures Imaging reads:
     ^MCAR(690,"AC",DFN,Inverted FM Date/Time,File #)
This IA will be modified as Medicine APIs are released to replace its
functions.  Imaging and Medicine will participate actively in the testing
process to be sure API's meet Imaging's needs.  Imaging will migrate to the
use of API's as soon as possible.
     ^MCAR(690,D0,0)
       .01      NAME               0;1      Direct Global Read
                          ********************
2000     NAME: DBIA2000
CUSTODIAL PACKAGE: MEDICINE                     Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Next Version        VERSION: 2.3
FILE: 697.2                 ROOT: MCAR(697.2,
DESCRIPTION:                       TYPE: File
     ^MCAR(697.2,D0,0)
       .01      NAME                0;1      Direct Global Read
       1        GLOBAL LOCATION     0;2      Direct Global Read
       1.1      MEDICAL PATIENT     0;12     Direct Global Read
       3        TYPE OF PROCEDURE   0;4      Direct Global Read
       7        PRINT NAME          0;8      Direct Global Read
     ^MCAR(697.2,D0(1),'CPT',D0,0)
       1000     CPT                 0;1      Direct Global Read
                          ********************
2001     NAME: DBIA2001
CUSTODIAL PACKAGE: MEDICINE                     Chicago
SUBSCRIBING PACKAGE: IMAGING                      Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
```

```
FILE: 691                    ROOT: MCAR(691,
DESCRIPTION:                        TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for ECHOCARDIOGRAPHY.  FILE^DICN is used to create a new file 691 entry, when
necessary. The IMAGE multiple, field 2005, is processed by direct global
read/writes.

This IA will be modified as Medicine APIs are released to replace its
functions.  Imaging and Medicine will participate actively in the testing
process to be sure API's meet Imaging's needs.  Imaging will migrate to the
use of API's as soon as possible.
     ^MCAR(691,D0,0)
       1        1 MEDICAL PATIENT    0;2      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(691,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(691,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                          ********************
2002     NAME: DBIA2002
CUSTODIAL PACKAGE: MEDICINE                      Chicago
SUBSCRIBING PACKAGE: IMAGING                       Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
FILE: 691.1                  ROOT: MCAR(691.1,
DESCRIPTION:                        TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is  require
for CARDIAC CATHETERIZATION. FILE^DICN is used to create a new file 691.1
entry, when necessary. The IMAGE multiple, field 2005, is processed by direct
global read/writes.
     ^MCAR(691.1,D0,0)
       1        MEDICAL PATIENT      0;2      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(691.1,D0(1),3,D0,0)
       .01      PROCEDURE            0;1      Direct Global Read
     ^MCAR(691.1,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(691.1,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                          ********************
2003     NAME: DBIA2003
CUSTODIAL PACKAGE: MEDICINE                      Chicago
SUBSCRIBING PACKAGE: IMAGING                       Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
FILE: 691.5                  ROOT: MCAR(691.5,
DESCRIPTION:                        TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for ELECTROCARDIOGRAM. FILE^DICN is used to create a new file 691.5 entry,
when necessary. The IMAGE multiple, field 2005, is processed by direct global
read/writes.
     ^MCAR(691.5,D0,0)
```

```
       1        MEDICAL PATIENT      0;2      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(691.5,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(691.5,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                              ********************
2004     NAME: DBIA2004
CUSTODIAL PACKAGE: MEDICINE                        Chicago
SUBSCRIBING PACKAGE: IMAGING                         Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
FILE: 694                    ROOT: MCAR(694,
DESCRIPTION:                         TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for HEMATOLOGY. FILE^DICN is used to create a new file 694 entry, when
necessary.
IMAGE multiple, field 2005, is processed by direct global read/writes.
     ^MCAR(694,D0,0)
       1        MEDICAL PATIENT      0;2      Direct Global Read
       2        PROCEDURE            0;3      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(694,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(694,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                              ********************
2006     NAME: DBIA2006
CUSTODIAL PACKAGE: MEDICINE                        Chicago
SUBSCRIBING PACKAGE: IMAGING                         Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
FILE: 699                    ROOT: MCAR(699,
DESCRIPTION:                         TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for ENDOSCOPY/CONSULT. FILE^DICN is used to create a new file 699 entry, when
necessary. The IMAGE multiple, field 2005, is processed by direct global
read/writes.
     ^MCAR(699,D0,0)
       .02      MEDICAL PATIENT      0;2      Direct Global Read
       1        PROCEDURE            0;12     Direct Global Read
       .01      APPOINTMENT DATE/TIM 0;1      Direct Global Read
     ^MCAR(699,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(694,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                              ********************
2007     NAME: DBIA2007
CUSTODIAL PACKAGE: MEDICINE                        Chicago
SUBSCRIBING PACKAGE: IMAGING                         Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
```

```
FILE: 699.5                    ROOT: MCAR(699.5,
DESCRIPTION:                          TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for GENERALIZED PROCEDURE/CONSULT. FILE^DICN is used to create a new file
699.5 entry, when necessary. The IMAGE multiple, field 2005, is processed by
direct global read/writes.
     ^MCAR(699.5,D0,0)
       .02      MEDICAL PATIENT      0;2      Direct Global Read
       .05      SUBSPECIALTY         0;6      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(699.5,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(699.5,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                          ********************
2008     NAME: DBIA2008
CUSTODIAL PACKAGE: MEDICINE                      Chicago
SUBSCRIBING PACKAGE: IMAGING                       Washington
USAGE: Private            APPROVED:
STATUS:                     EXPIRES:
DURATION: Next Version        VERSION:
FILE: 701                     ROOT: MCAR(701,
DESCRIPTION:                          TYPE: File
For the purpose of appending an Image to an existing Medicine procedure or
placing an Image into a new Medicine Procedure read/write access is require
for RHEUMATOLOGY. FILE^DICN is used to create a new file 701 entry, when
necessary. The IMAGE multiple, field 2005, is processed by direct global
read/writes.
     ^MCAR(701,D0,0)
       1        MEDICAL PATIENT      0;2      Direct Global Read
       .01      DATE/TIME            0;1      Direct Global Read
     ^MCAR(701,D0(1),2005,D0,0)
       .01      IMAGE                0;1      Direct Global R/W
     ^MCAR(701,D0,.2)
       600      PROCEDURE SUMMARY    .2;2     Direct Global Read
                          ********************
2009     NAME: DBIA2009
CUSTODIAL PACKAGE: MEDICINE                      Chicago
SUBSCRIBING PACKAGE: IMAGING                       Washington
USAGE: Private            APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Next Version        VERSION:
FILE:                         ROOT:
DESCRIPTION:                          TYPE: Routine
This supported reference allows the Imaging package user to view a medicine
package textual report that is linked to the image.
ROUTINE: MCMAGDSP
   COMPONENT:  REPRT
   VARIABLES:  ien         Input         Medicine procedure IEN.
                             file        Input         Medicine procedure
file number.
 This entry point is called with the file internal entry number(IEN) and the
file number in the actual list.  For example:  DO REPRT^MCMAGDSP(ien,file)

   The Medicine package routine MCMAGDSP calls the appropriate routine.
                          ********************
```

```
   2033     NAME: DBA2033
   CUSTODIAL PACKAGE: SURGERY
   SUBSCRIBING PACKAGE: IMAGING                        Washington
   USAGE: Supported          APPROVED:
   STATUS:                     EXPIRES:
   DURATION: Till Otherwise Agr  VERSION:
   FILE:                        ROOT:
   DESCRIPTION:                          TYPE: Routine
   The purpose of this agreement is to provide access to the Surgery package
   (custodian) by the Imaging package (subscriber) for obtain a surgical case
   listing to append images to. Requesting permission to use the Surgery API,
   GET^SROGTSR, for listing surgical cases.
   ROUTINE: SROGTSR
   COMPONENT:  GET
   VARIABLES:  SRDFN       Input   Patient's ien
               SRGY        Output    An array of surgery cases:  array(0)="# of
   cases found" or "0^There are no cases entered" array(#)="#^display
   date^description^surgery ien^internal date format
   Obtains a listing of surgery cases for the patient specified by the calling
   routine.  An array will be passed with the following: array(0)="# of cases
   found" or "0^ There are no cases entered" array(#)="#^display
   date^description^surgery ien^internal date format
                               ********************
   2039     NAME: MEDICINE UPDATE API
   CUSTODIAL PACKAGE: MEDICINE                       Chicago
   SUBSCRIBING PACKAGE: IMAGING                        Washington
   USAGE: Controlled Subscri APPROVED:
   STATUS:                      EXPIRES:
   DURATION: Till Otherwise Agr  VERSION:
   FILE:                        ROOT:
   DESCRIPTION:                          TYPE: Routine
   This entry point creates new entries, if needed, in the Medical Patient file
   (#690) and the Medicine Procedure data files (see file list under MCD0).  It
   also allows the Imaging package to populate the Image multiple in the
   Medicine Procedure data files.
   ROUTINE: MCUIMAG0
   COMPONENT:  UPDATE
   VARIABLES:  UPDATE^MCUIMAGO(MCDATE,MCPROCD0,MCDFN,.MCMAGPTR,[.]MCD0,.OK)
   Input
MCDATE =
   Date/Time of a procedure (VA FileMan internal format)
MCPROCD0 =
   A pointer to the Procedure/Subspecialty file (#697.2) e.g.,
      ^MCAR(697.2,MCPROCD0,...
MCDFN =
   A pointer to the Patient file (#2), e.g, ^DPT(MCDFN,...
MCMAGPTR() =
   An array whose subscripts are pointers to the Image file (20005).The elements of
      the array should be set to null. To create a new Medicine Procedure data stub
      record without image data, set this parameter such that $O(MCMAGPTR(0))'>0.
      (Also see MCD0.)
MCD0 =
   A pointer to one of the entries in one of the Medicine Procedure data files, e.g.,
      ^MCAR(691,MCD0,...This parameter may be passed by reference or by value. If
      passed by reference, it will be returned as Pointer#^File# if there were no
      problems (ie., OK>0).
```

```
If OK'>0, the value of MCD0 should not be relied on. Pass in this parameter
   as null to create a new stub  record in one of the Medicine Procedure data
   files.  (Also see MCMAGPTR.)  A list of Medicine Procedure data files
   follows:  691*, 691.1*, 691.5*, 691.6, 691.7, 691.8, 694*, 694.5, 698,
   698.1, 698.2,  698.3, 699*,  699.5*, 700, 701* Note, only those marked
   with a '*' have Image pointer multiples.
OK =
      A return flag variable
Output
MCMAGPTR() =
An array whose subscripts are pointers to the Image file (#2005)  Returned
   as: MCMAGPTR('File_#2005_Pointer')=MCFILE ^ MCD0 ^ MCD1, e.g.,
   ^MCAR(MCFILE,MCD0,2005,MCD1,0)='File_#2005_Pointer'
      OK =  Flag: '1^Message' = All is well,
      '0^Message' = Bad news
The list of possible return values is shown below:

0^Medicine Procedure file global location not found
MEANING: The Global Location field (#1) in the Procedure / Subspecialty file
(#697.2) has a value in it that is less than or equal to zero.

0^Medical Patient field not found in Medicine Procedure file
MEANING: A field that points to the Patient file (#2) could not be found in
the Medicine Procedure data file (see file list under MCD0).

0^Medicine Procedure file global name not found
MEANING: The global root of the Medicine Procedure data file (see file list
under MCD0) could not be found.  (File file (#1) problem)

0^Medicine Procedure file global subscript location not found
MEANING: The node on which the image pointer multiple stores its data could
not be found (Medicine DD problem).

0^Cannot add patient to Medical Patient file
MEANING: A new record could not be created in the Medical Patient file
(#690).

0^Cannot create stub record in the Medicine Procedure data file
MEANING: A new stub record could not be created in one of the Medicine
Procedure data files (see file list under MCD0).

0^No image number to file in Medicine Procedure file
MEANING: The MCMAGPTR() array was not passed in, does not contains any data,
or was passed in incorrectly.

0^Image field not found in the Medicine Procedure file
MEANING: A field number of 2005 was not found in the Medicine Procedure data
file (see file list under MCD0).

0^Cannot add image to Medicine Procedure file
MEANING: A new image sub-record could not be added to the Image multiple
(#2005) in the Medicine Procedure data file (see file list under MCD0).

0^Patient mismatch
MEANING: The Medicine Procedure data file record  pointed to by  the MCD0
parameter has a different Patient file (#2) pointer  than the Patient file
(#2) pointer that was passed in in the MCDFN parameter.
```

0^Procedure/Subspecialty mismatch
MEANING: The Medicine Procedure data file record pointed to by the MCD0 parameter has a different Procedure / Subspecialty file (#697.2) pointer than the Procedure / Subspecialty file (#697.2) pointer that was passed in the MCPROCD0 parameter.

0^Procedure is invalid
MEANING: The value passed in the MCPROCD0 parameter failed the input transform of the field it was going to be stuffed into.

0^Entry 'GENERIC PROCEDURE' not found
MEANING: The 'GENERIC PROCEDURE' entry was not found in the Procedure/Subspecialty file (#697.2). This message is only valid after the installation of patch MC*2.3*8.

0^Entry 'GENERIC SUBSPECIALTY' not found
MEANING: The 'GENERIC SUBSPECIALTY' entry was not found in the Procedure/Subspecialty file (#697.2). This message is only valid after the installation of patch MC*2.3*8.

0^Invalid Procedure/Subspecialty
MEANING: The pointer to the Procedure/Subspecialty file (697.2) (MCPROCD0) is not flagged as a procedure or a subspecialty in the 'Procedure/Subspecialty' field (697.2,1001). This message is only valid the installation of patch MC*2.3*8.

1^Record match found
MEANING: The Medicine Procedure data file record pointed to by the MCD0 parameter has Patient file (#2) and Procedure /Subspecialty (#697.2) pointers that match the values passed in the MCDFN and MCPROCD0 parameters. Note, this message is used internally within the API and you will most likely never see it since it will be superseded by one of the other messages.

1^New stub record created in Medicine Procedure data file
MEANING: New stub record have been created in the Medical Patient file (#690) (if needed) and one of the Medicine Procedure data files (see file list under MCD0). Note, this message will only be returned if $O(MCMAGPTR(0))'>0 and MCD0'>0 and the creation of the new record(s) was successful

1^The Medicine Procedure file has been updated
MEANING: The Image file (#2005) pointers passed in the MCMAGD0() array have been added to (or have been found to previously exist in) the Image multiple (#2005) of the Medicine Procedure data file (see file list under MCD0).

****

2040 NAME: MEDICINE KILL API
CUSTODIAL PACKAGE: MEDICINE Chicago
SUBSCRIBING PACKAGE: IMAGING Washington
USAGE: Controlled Subscri APPROVED:
STATUS: EXPIRES:
DURATION: Till Otherwise Agr VERSION: FILE:
ROOT:
DESCRIPTION: TYPE: Routine
This entry point removes entries from the Image multiples in the Medicine Procedure data files.
ROUTINE: MCUIMAG0

```
COMPONENT:  KILL
VARIABLES:      Input
MCFILE   =  A Medicine Procedure data file number: 691*, 691.1*, 691.5*,
691.6, 691.7,691.8, 694*, 694.5 698,  698.1, 698.2,  698.3, 699*,  699.5*,
700,  701* (Note: only those marked with a '*' have Image pointer multiples)
MCD0     =  A pointer to one of the entries in one of the Medicine Procedure
data files, e.g.,^MCAR(MCFILE,MCD0,...
MCD1     =  A pointer to one of the entries in the in the Image multiple,(
e.g., ^MCAR(MCFILE,MCD0,2005,MCD1,0)='File_#2005_Pointer'
OK       =  A return flag variable

Output
OK       =  Flag: '1^Message' = All is well, '0^Message' =Bad news  The list
of possible return values is shown below:

0^Image field not found in the Medicine Procedure file
MEANING: A pointer to the Image file (#2005) was not found in the Medicine
Procedure data file (see file list under MCD0).

0^Medicine Procedure file global name not found
MEANING: The global root of the Medicine Procedure data file (see file list
under MCD0) could not be found.  (File file (#1) problem)

0^Medicine Procedure file global subscript location not found
MEANING: The node on which the image pointer multiple stores its data could
not be found (Medicine DD problem).

1^Image pointer deleted from Medicine Procedure file
MEANING: The pointer to the Image file (#2005) has been removed from the
Medicine Procedure data file.
                          ********************
2041     NAME: DB2041
CUSTODIAL PACKAGE: REGISTRATION
SUBSCRIBING PACKAGE: IMAGING                        Washington
USAGE: Supported          APPROVED:
STATUS:                     EXPIRES:
DURATION:                     VERSION:
FILE:                        ROOT:
DESCRIPTION:                          TYPE: Routine
 The Imaging Package is given permission to call ^DGRPD to display the
Patient Profile report.
ROUTINE: DGRPD
COMPONENT:  EN
VARIABLES:  IOP         Input    DEVICE NAME
            DFN         Input   Patient's internal entry number in file 2.
Prints a patient profile.  Passed to this routine is the device and patient's
DFN.
                           ***********************
2242     NAME: DBIA2242
CUSTODIAL PACKAGE: REGISTRATION                  Albany
SUBSCRIBING PACKAGE: IMAGING
USAGE: Controlled Subscri APPROVED: APPROVED
STATUS: Active              EXPIRES:
DURATION: Till Otherwise Agr  VERSION:
DESCRIPTION:                          TYPE: Routine
```

```
This DBIA will provide temporary entry points to routine DGSEC to enable the
listed packages to update the DG SECURITY LOG when a sensitive patient has
been accessed.

This will be in effect until supported entry points are defined.
ROUTINE: DGSEC
COMPONENT:  BULTIN
VARIABLES:  Y           Input    Y = DFN, Pointer to the PATIENT file (#2)
               DGOPT       Input     S DGOPT=$S(XQOPT<0:"^UNKNOWN",1:XQOPT)
equals the calling option
               XMCHAN      Input    Set = 1 to suppress dots printed by
mailman
               DIC(0)      Input      Set = $TR(DIC(0),"E")  to suppress
output and prompting.  Generate bulletin that Sensitive Patient has been
accessed.
COMPONENT:  SETLOG
VARIABLES:  Y           Input     Y = DFN, Pointer to the PATIENT file (#2)
               DGOPT       Input   S DGOPT=$S(XQOPT<0:"^UNKNOWN",1:XQOPT)
equals the calling option
               DG1         Input    Set = 1 for inpatient, = 0 for outpatient
               DIC(0)      Input    Set = $TR(DIC(0),"E")  to suppress output
and prompting
                  Create entry in DG SECURITY LOG of sensitive patient
access.
```

11.4 SACC Exemptions

11.4.1 Introduction

The **V***IST***A** Imaging Project uses the following non-SACC compliant background processor coding practices that are necessary for the operation of the **V***IST***A** Imaging System. The Imaging System consists of software running on user workstations, the main **V***IST***A** hospital system, and background processors. Globals are accessed by the background processor from the **V***IST***A** host systems via DDP. The system manages DOS image files located on magnetic servers and an optical disk jukebox. Because of this complex architecture, there are a number of cases where we must use coding practices that go beyond the standards. We have tried to follow Kernel approaches wherever possible and are working with the Kernel developers to create utilities to perform the extended file manipulation that is much needed by the Imaging software. These non-SACC compliant routines run only on the Background Processor systems, and should not be loaded onto **V***IST***A** servers.

11.4.2 External Calls

11.4.2.1 File I/O operations

The Imaging background processor system is required to make extensive use of file I/O operations. We have isolated all implementation-specific dependencies in a set of ^%ZMAGOSF routines (one for each implementation). The following file I/O operations are supported.

- Return the first host file system device
- Return the host file system byte offset
- Return the End of File indication
- Open a file in different modes
- Set the byte offset for a file I/O operation
- Returning the error code for $ZC
- Close file

11.4.2.2 Micronetics Host File Systems Commands

$ZOS is a Micronetics function for accessing the host file system and performing file and directory manipulation. The following DOS commands are implemented for MUMPS with $ZOS: DIR, RENAME, MKDIR, DEL, RMDIR, CD, etc. There are no equivalent standard MUMPS commands for performing these functions. Only the background processor MUMPS routines use these commands.

The **V***IST***A** Imaging System provides (DOS) file migration management services. It must uses these commands to control image file and directory location. All references to these commands are localized within the ^%ZMAGOSF routine. (Only the background processor MUMPS routines use these file commands.)

11.4.2.3 MUMPS Routine Directory Lookups; Routine Load and Save operations

The background processor MUMPS routine directory is read by ^%ZMAGOSF. Executable strings for handling MUMPS routine loading and saving are also defined in ^%ZMAGOSF. These are implementation dependent.

11.4.2.4 VIEW Command

The Imaging Background Processor System runs in a PC workstation environment as a MUMPS client making use of data on the main **V***IST***A** system. In order to perform certain administrative and application functions automatically, the executing process on the Imaging System must be able to move between the system area (MGR UCI) and the application area (VAH UCI). This requires use of the VIEW command and the $ZU Micronetics function. It also must be able to check on the status of connections to the host **V***IST***A** system.

Various Imaging System processes require DDP to be operational. If one of these processes detects a problem with DDP, the error processing will cause it to sleep for 10 minutes (H 600) and then attempts to restart DDP. This technique allows these processes to run without having to be rebooted each time the main hospital system is brought down. This code is isolated to one routine, ^MAGBSTRT.

11.4.2.5 Exclusive Kill - K (...)

Several of the tasks necessary for Imaging V. 2.0 run in the background on a separate PC. The tasks range from moving image files between devices to performing image processing.

The exclusive kill is used as part of the error trap to "clean the slate" of variables created by the previous task. (NEW-ed variables are not recorded by the error trap.) This is done after DDP communications are reestablished, just before the task is restarted. The exclusive kill is used between processing tasks, to remove old variables.

11.4.2.6 Miscellaneous Micronetics Functions and System Variables

$ZH is used to handle decimal/hexadecimal conversion. (It is used once in an extrinsic function in ^%ZMAGOSF.)

A call to SRVN+1^DDP is required to start DDP on the workstation under MSM because no silent entry point is available. This is done automatically in the background, without user interaction.

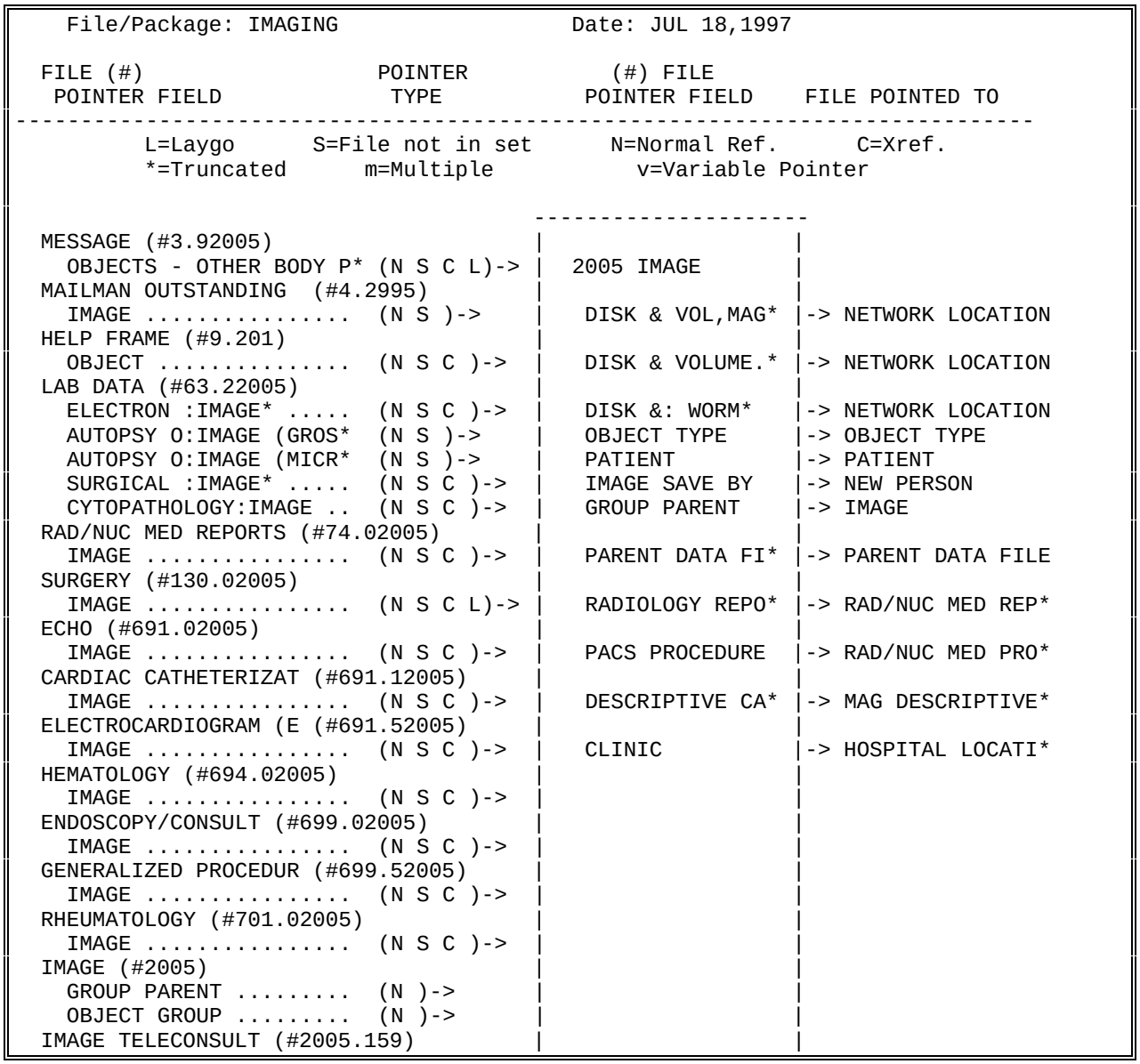
Chapter 12 Internal Relations

12.1 Orientation

Some basic principles are followed within the Imaging package.

- All file reference lookups must use the MAGFILEA "mediator" routine.
- All updating of File 2005 and external package pointers occur in MAGGTIA or MAGGTIA1.

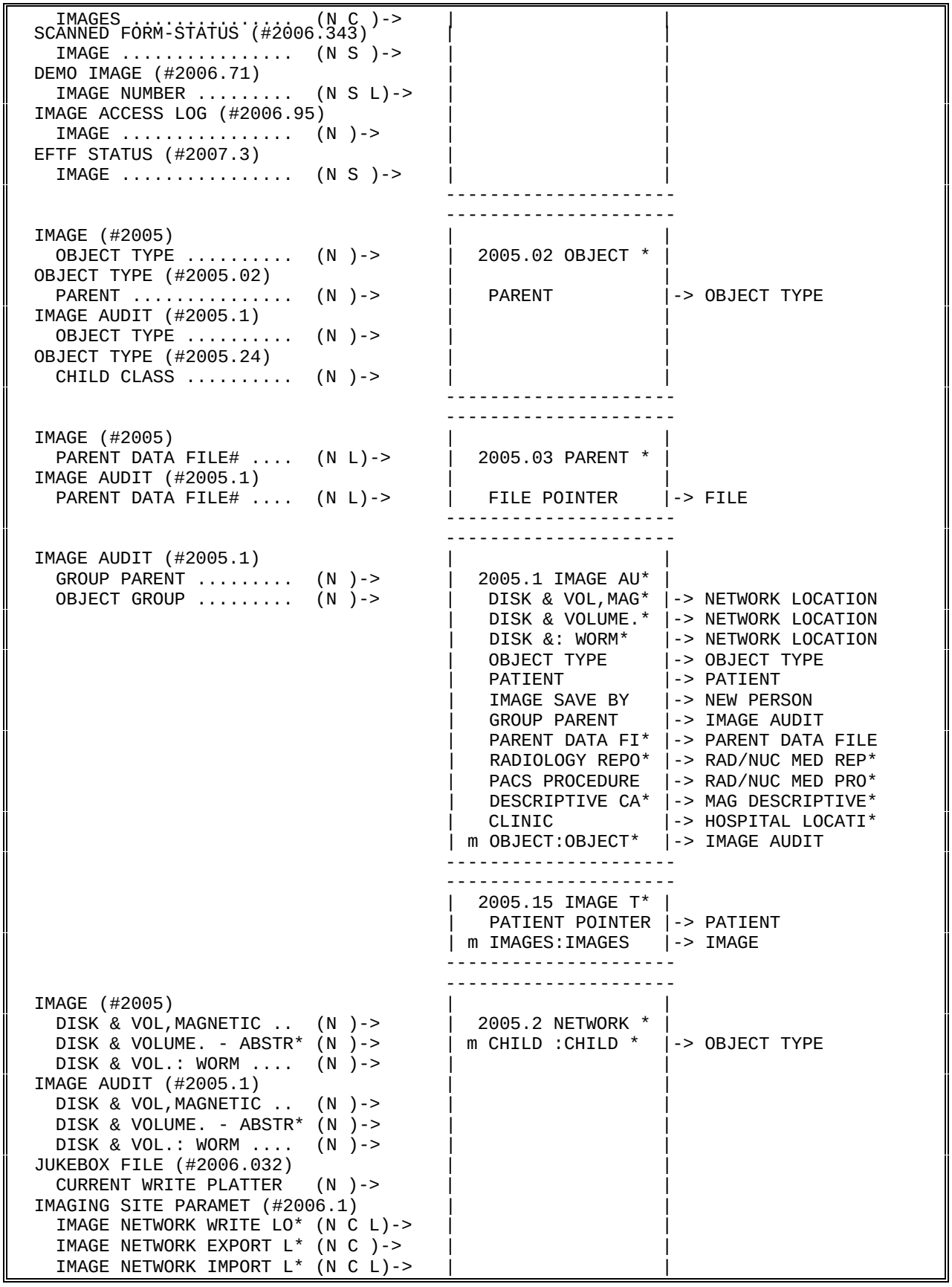
12.2 Pointers

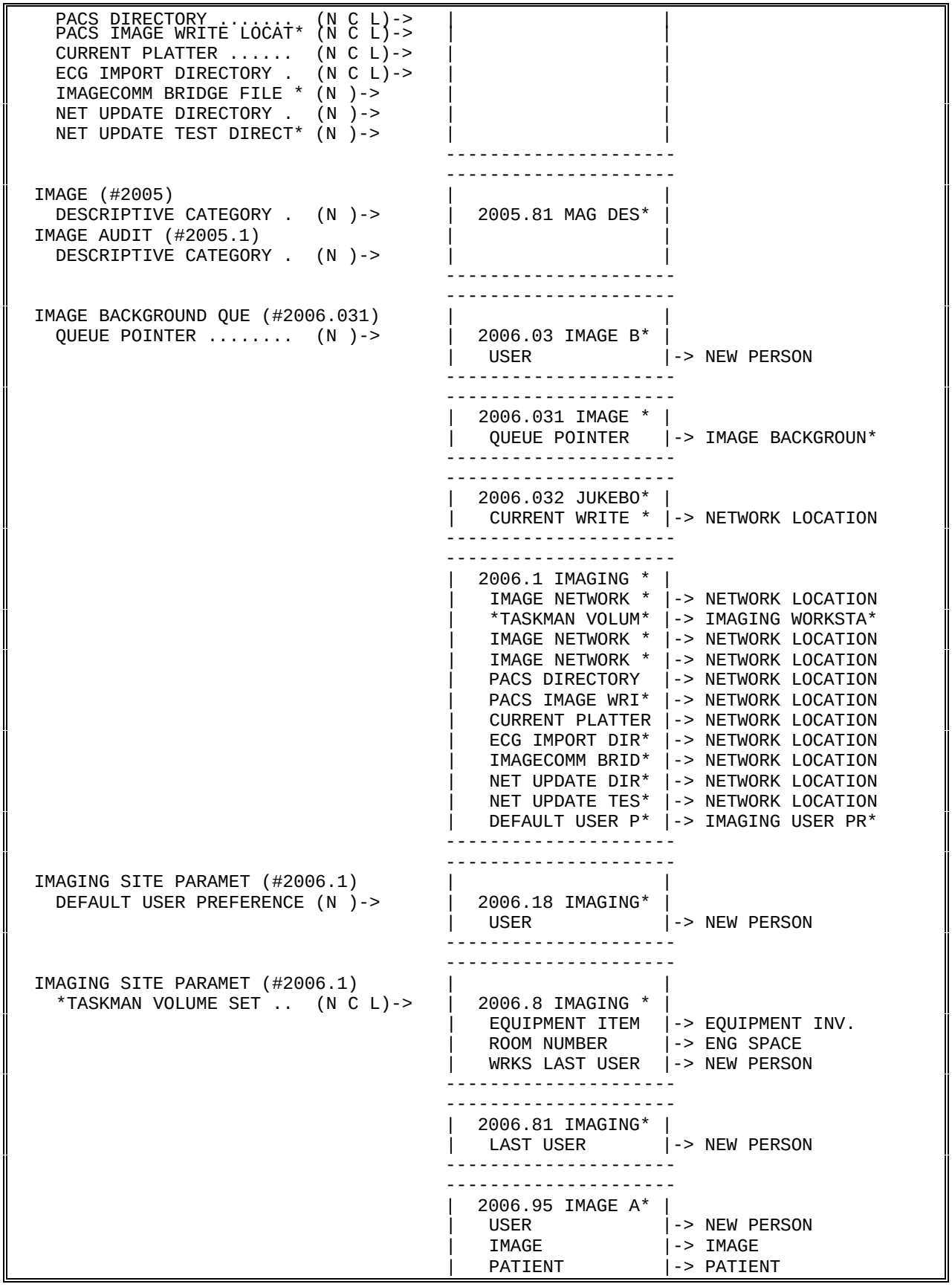


```
   File/Package: IMAGING                 Date: JUL 18,1997

  FILE (#)                   POINTER          (#) FILE
   POINTER FIELD              TYPE           POINTER FIELD    FILE POINTED TO
-------------------------------------------------------------------------------
          L=Laygo      S=File not in set      N=Normal Ref.      C=Xref.
          *=Truncated      m=Multiple           v=Variable Pointer

                                          ---------------------
  MESSAGE (#3.92005)                     |                     |
    OBJECTS - OTHER BODY P* (N S C L)-> |  2005 IMAGE         |
  MAILMAN OUTSTANDING  (#4.2995)         |                     |
    IMAGE ..............  (N S )->      |   DISK & VOL,MAG*  |-> NETWORK LOCATION
  HELP FRAME (#9.201)                    |                     |
    OBJECT ..............  (N S C )->   |   DISK & VOLUME.*  |-> NETWORK LOCATION
  LAB DATA (#63.22005)                   |                     |
    ELECTRON :IMAGE* .....  (N S C )->   |   DISK &: WORM*    |-> NETWORK LOCATION
    AUTOPSY O:IMAGE (GROS*  (N S )->     |   OBJECT TYPE      |-> OBJECT TYPE
    AUTOPSY O:IMAGE (MICR*  (N S )->     |   PATIENT          |-> PATIENT
    SURGICAL :IMAGE* .....  (N S C )->   |   IMAGE SAVE BY    |-> NEW PERSON
    CYTOPATHOLOGY:IMAGE ..  (N S C )->   |   GROUP PARENT     |-> IMAGE
  RAD/NUC MED REPORTS (#74.02005)        |                     |
    IMAGE ..............  (N S C )->     |   PARENT DATA FI*  |-> PARENT DATA FILE
  SURGERY (#130.02005)                   |                     |
    IMAGE ..............  (N S C L)->   |   RADIOLOGY REPO*  |-> RAD/NUC MED REP*
  ECHO (#691.02005)                      |                     |
    IMAGE ..............  (N S C )->     |   PACS PROCEDURE   |-> RAD/NUC MED PRO*
  CARDIAC CATHETERIZAT (#691.12005)      |                     |
    IMAGE ..............  (N S C )->     |   DESCRIPTIVE CA*  |-> MAG DESCRIPTIVE*
  ELECTROCARDIOGRAM (E (#691.52005)      |                     |
    IMAGE ..............  (N S C )->     |   CLINIC           |-> HOSPITAL LOCATI*
  HEMATOLOGY (#694.02005)                |                     |
    IMAGE ..............  (N S C )->     |                     |
  ENDOSCOPY/CONSULT (#699.02005)         |                     |
    IMAGE ..............  (N S C )->     |                     |
  GENERALIZED PROCEDUR (#699.52005)      |                     |
    IMAGE ..............  (N S C )->     |                     |
  RHEUMATOLOGY (#701.02005)              |                     |
    IMAGE ..............  (N S C )->     |                     |
  IMAGE (#2005)                          |                     |
    GROUP PARENT .........  (N )->       |                     |
    OBJECT GROUP .........  (N )->       |                     |
  IMAGE TELECONSULT (#2005.159)          |                     |
```


IMAGES ..... (N C)->
SCANNED FORM-STATUS (#2006.343)
IMAGE ..... (N S)->
DEMO IMAGE (#2006.71)
IMAGE NUMBER ..... (N S L)->
IMAGE ACCESS LOG (#2006.95)
IMAGE ..... (N)->
EFTF STATUS (#2007.3)
IMAGE ..... (N S)->
IMAGE (#2005)
OBJECT TYPE ..... (N)->
OBJECT TYPE (#2005.02)
PARENT ..... (N)->
IMAGE AUDIT (#2005.1)
OBJECT TYPE ..... (N)->
OBJECT TYPE (#2005.24)
CHILD CLASS ..... (N)->
2005.02 OBJECT *
PARENT
-> OBJECT TYPE
IMAGE (#2005)
PARENT DATA FILE# .... (N L)->
IMAGE AUDIT (#2005.1)
PARENT DATA FILE# .... (N L)->
2005.03 PARENT *
FILE POINTER
-> FILE
IMAGE AUDIT (#2005.1)
GROUP PARENT ..... (N)->
OBJECT GROUP ..... (N)->
2005.1 IMAGE AU*
DISK & VOL,MAG*
-> NETWORK LOCATION
DISK & VOLUME.*
-> NETWORK LOCATION
DISK &: WORM*
-> NETWORK LOCATION
OBJECT TYPE
-> OBJECT TYPE
PATIENT
-> PATIENT
IMAGE SAVE BY
-> NEW PERSON
GROUP PARENT
-> IMAGE AUDIT
PARENT DATA FI*
-> PARENT DATA FILE
RADIOLOGY REPO*
-> RAD/NUC MED REP*
PACS PROCEDURE
-> RAD/NUC MED PRO*
DESCRIPTIVE CA*
-> MAG DESCRIPTIVE*
CLINIC
-> HOSPITAL LOCATI*
m OBJECT:OBJECT*
-> IMAGE AUDIT
2005.15 IMAGE T*
PATIENT POINTER
-> PATIENT
m IMAGES:IMAGES
-> IMAGE
IMAGE (#2005)
DISK & VOL,MAGNETIC .. (N)->
DISK & VOLUME. - ABSTR* (N)->
DISK & VOL.: WORM .... (N)->
IMAGE AUDIT (#2005.1)
DISK & VOL,MAGNETIC .. (N)->
DISK & VOLUME. - ABSTR* (N)->
DISK & VOL.: WORM .... (N)->
JUKEBOX FILE (#2006.032)
CURRENT WRITE PLATTER (N)->
IMAGING SITE PARAMET (#2006.1)
IMAGE NETWORK WRITE LO* (N C L)->
IMAGE NETWORK EXPORT L* (N C)->
IMAGE NETWORK IMPORT L* (N C L)->
2005.2 NETWORK *
m CHILD :CHILD *
-> OBJECT TYPE


PACS DIRECTORY ..... (N C L)->
PACS IMAGE WRITE LOCAT* (N C L)->
CURRENT PLATTER ..... (N C L)->
ECG IMPORT DIRECTORY . (N C L)->
IMAGECOMM BRIDGE FILE * (N)->
NET UPDATE DIRECTORY . (N)->
NET UPDATE TEST DIRECT* (N)->
IMAGE (#2005)
DESCRIPTIVE CATEGORY . (N)->
2005.81 MAG DES*
IMAGE AUDIT (#2005.1)
DESCRIPTIVE CATEGORY . (N)->
IMAGE BACKGROUND QUE (#2006.031)
QUEUE POINTER ..... (N)->
2006.03 IMAGE B*
USER
-> NEW PERSON
2006.031 IMAGE *
QUEUE POINTER
-> IMAGE BACKGROUN*
2006.032 JUKEBO*
CURRENT WRITE *
-> NETWORK LOCATION
2006.1 IMAGING *
IMAGE NETWORK *
-> NETWORK LOCATION
TASKMAN VOLUM
-> IMAGING WORKSTA*
IMAGE NETWORK *
-> NETWORK LOCATION
IMAGE NETWORK *
-> NETWORK LOCATION
PACS DIRECTORY
-> NETWORK LOCATION
PACS IMAGE WRI*
-> NETWORK LOCATION
CURRENT PLATTER
-> NETWORK LOCATION
ECG IMPORT DIR*
-> NETWORK LOCATION
IMAGECOMM BRID*
-> NETWORK LOCATION
NET UPDATE DIR*
-> NETWORK LOCATION
NET UPDATE TES*
-> NETWORK LOCATION
DEFAULT USER P*
-> IMAGING USER PR*
IMAGING SITE PARAMET (#2006.1)
DEFAULT USER PREFERENCE (N)->
2006.18 IMAGING*
USER
-> NEW PERSON
IMAGING SITE PARAMET (#2006.1)
*TASKMAN VOLUME SET .. (N C L)->
2006.8 IMAGING *
EQUIPMENT ITEM
-> EQUIPMENT INV.
ROOM NUMBER
-> ENG SPACE
WRKS LAST USER
-> NEW PERSON
2006.81 IMAGING*
LAST USER
-> NEW PERSON
2006.95 IMAGE A*
USER
-> NEW PERSON
IMAGE
-> IMAGE
PATIENT
-> PATIENT

Chapter 13 Package-wide Variables

MAGSYS contains the three-letter volume set name for the workstation. There are no other package-wide variables at the present time.

Chapter 14 Online Documentation

14.1 On-line Help

Winhelp is available from the Help menu in Imaging V. 2.0. Imaging V. 2.0 Winhelp is adapted from the Imaging V. 2.0 User's Guide.

14.2 Printing Data Dictionaries

The Data Dictionaries (DDs) are considered part of the on-line documentation for this software application. It may be necessary to print the DDs in order to support the package at your site.

The Data Dictionaries for the **V***IST***A** Imaging System files may be printed using the VA FileManager's option LIST FILE ATTRIBUTES under the DATA DICTIONARY UTILITIES menu as follows:

```
VA FileMan 20.0
Select OPTION: DATA DICTIONARY UTILITIES
Select DATA DICTIONARY UTILITY OPTION: LIST FILE ATTRIBUTES
 START WITH WHAT FILE: // IMAGE
             GO TO WHAT FILE: // IMAGE
              Select SUB-FILE: <RET>
Select LISTING FORMAT: STANDARD// BRIEF
ALPHABETICALLY BY LABEL? NO// YES
DEVICE: [enter printer device here]
```

The DD will now print on the user's specified device.

Glossary

Annotation	The ability to attach notes to images.
Architecture	The design of the components of a computer, network, or software system.
Archive	The long term storage of data or images.
Audit trail	Record of activity on a particular file or computer.
Background processing	Simultaneous running of a "job" on a computer while working on another job. Examples would be printing one document while working on another, or the software may do automatic saves while you are working on something else.
BLOB	Binary Large Object. A non-textual unit of data.
Brightness	The balance of light and dark shades in an image.
Composite video	TV signal which sends color, vertical and horizontal signals together.
Contrast	Range between the lightest and darkest tones in an image.
DICOM	Digital Imaging and Communications in Medicine. A medical imaging standard, DICOM is standard for Radiology equipment and is being adopted by the other members of the medical imaging community.
Digital camera	A camera that transforms a picture into a system of numbers. The picture can then be manipulated pixel (dot) by pixel, and stored and transmitted as a file.
File	All the data that describes a document or image.
File protection	Techniques for preventing files from being erased.
File server	A machine where shared software and data files are stored.
Frame grabber	A device that translates a frame from a video image into a still digitized image.

Gray scale	The range of shades of black in an image. The more shades recognized by the device, the clearer and sharper the image will be.
High resolution	An image or a display that has more pixels per inch than a conventional display/
Hot spot	The single pixel that is activated by selection using a mouse, light pen, or other means.
Image	The computerized representation of a picture, or graphic.
Image abstract	A "thumbnail" version of an image, which requires less computer processing resources to display than the actual image.
Image group	A group of images associated with a medical examination.
Image processing	The translation of an image into a digital computer language so that it may be manipulated in size, color, clarity, or to enhance portions of it.
Image resolution	The fineness or coarseness of an image.
Imaging system	Collection of units that work together to capture and recreate images.
Jitter	The flickering of a displayed image.
Jukebox	A device that holds multiple optical discs and can swap them in and out of the drive as needed.
Level	The pixel value (brightness) of a greyscale image that is displayed at 50% brightness.
Login (Logon)	Procedure for gaining access to the system or program.
Mouse	Hand driven input and pointing device.
Multimedia	Combining more than one media for the dissemination of information (i.e., text, graphics, full video motion, audio).

Off-line	Something that is not available for access on the system.
On-line	Something that is available for access on the system.
Optical disc	A direct access storage device that is written to and read by laser light. Optical discs can store more data per unit of surface area than magnetic media. Many optical discs are Write Once Read Many (WORM).
Pan	To view different parts of the image that extend beyond the borders of the screen by moving the image.
Pixel	The individual dots that define a picture.
Resolution	Measure of output quality (dpi—dots per inch) or halftone quality (lpi—lines per inch).
Retrieval	The ability to search for, select, and display a document or image from storage.
RGB	Red, Green, Blue. The colors used in varying combinations and intensities on monitors, TV screens, and other color displays.
Scaling	Uniformly changing the size of an image.
Scanner	A device that converts a hardcopy image into machine-readable code.
Server	A computer which is dedicated to one task.
Storage media	The physical device onto which data is recorded.
TWAIN	An interface standard for scanners, cameras and other input devices.
User preferences	The preferences that each user sets in the User Preferences window that control the circumstances and ways in which the Imaging package displays images.
Video camera	Camera which records full-motion video.

Video digitizer	A device that changes a video picture into a digital computer language.
V*IST***A**	Veterans Health Information System Technology Architecture. **V***IST***A** replaces DHCP.
Window	A rectangular area on a screen (sometimes within another window) that contains controls, such as drop-down boxes, icons, scroll-bars and/or buttons.
Workstation	A high-powered machine for a single user, typically used for computer-aided design or complex analysis.
Write Once Read Many (WORM)	Once written to the disc, data is only available for reading and cannot be altered.
WYSIWYG	"What you see is what you get." The feature of seeing images and text exactly as they will look when printed or transmitted.
Zoom	To enlarge an image or a portion of an image.

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